

NAVAL MEDICAL RESEARCH UNIT DAYTON

EVALUATION OF 10 JET FUELS IN THE SALMONELLA-ESCHERICHIA COLI MUTAGENICITY ASSAY

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ABSTRACT

The focus of this study was to evaluate the toxicity of ten jet fuels of interest to the United States Department of Defense. Specifically, this study aimed to determine the potential of the jet fuels to induce DNA damage that may lead to genetic mutations. All of the jet fuels tested were considered to be negative for mutagenicity in the bacterial reverse mutation assay using *Salmonella* and *E. coli* strains. Based on the parameters used in this *in vitro* study, Citgo JP8 (POSF 4658), Valero 25% Aromatic JP8 (POSF 8457), KiOR Hydrotreated Kerosene/Bio-Kerosene (POSF 10327), ARA ReadiJet (POSF 10328), Amyris Farnesane (POSF 10329), Virent HDO-SK (POSF 10330), TS-1 (Specification number 10227-86), Gevo 7695 with JP8 additives (POSF 7699), Gevo 10262 with JP8 additives (POSF 10263), and Swedish Biofuel 7633 with JP8 additives (POSF 8452) are considered to be nonmutagenic.

PURPOSE AND OBJECTIVE OF STUDY

The objective of this study was to evaluate the capability of ten individual jet fuels to induce DNA damage that may lead to genetic mutations. This study utilizes bacterial test systems, specifically four strains of genetically altered *Salmonella typhimurium* and one strain of genetically altered *Escherichia coli*, to assess different types of mutations. This study also takes into account the potential genotoxicity associated with compounds or intermediates that may result from metabolism of the parent compound(s). This study was conducted in accordance with the OECD Guideline for Testing of Chemicals 471 (Bacterial Reverse Mutation Test) and the U.S. Environmental Protection Agency (EPA) Health Effects Test Guidelines OPPTS 870.5100 (Bacterial Reverse Mutation Test).

STUDY DESIGN

Premise of the Bacterial Reverse Mutation Test. This study was designed to be in line with the OECD Guideline for Testing of Chemicals 471 (Bacterial Reverse Mutation Test) and the U.S. EPA Health Effects Test Guidelines OPPTS 870.5100 (Bacterial Reverse Mutation Test). The strains utilized for this assay are genetically altered (i.e., mutated), leaving them unable to synthesize an essential amino acid (histidine for the *Salmonella typhimurium* strains and tryptophan for the *Escherichia coli* strain). When histidine/tryptophan is not supplied to the bacteria, they are unable to grow and form colonies. However,

new mutations that occur within "hot spots" of these bacterial strains can result in the reversion of the preexisting mutations, reinstating the ability of the bacteria to synthesize their own histidine/tryptophan. Upon this reversion, the bacteria are then able to grow and form colonies in the absence of externally supplied histidine/tryptophan. Therefore, should genotoxic or mutagenic potential of the test substance exist, exposure of the test system (i.e., bacterial strains) to the test substance (i.e., jet fuel) will result in a reverse mutation, restoring bacterial growth and yielding an increased number of colonies for the affected strain.

This study employed the conventional approach of the plate incorporation method. The standard plate incorporation method involves combining the test substance and test system in a liquid agar matrix. This combined mixture is then added to an already solidified bottom agar. Exposures can take place in the absence or presence of a metabolic activation mix. This mixture allows for conversion of parent compound(s) to other intermediates or end-product compounds that may result from metabolism of the starting substance.

Dilutions and Dose Levels. All test substances were diluted in solvent immediately prior to use. The highest dose level was 5 μl test substance/plate, per the recommendation of OECD and U.S. EPA OPPTS Guidelines. This dose level was evaluated for ability to induce cytotoxicity (bacterial cell death) *Salmonella* TA-100. Five μl/plate was utilized as the high dose, except in cases where cytotoxicity was induced. Test substances were serially diluted in solvent to attain six dose levels, such that doses were 5, 2.5, 1.25, 0.625, 0.313, 0.156 μl/plate. Where cytotoxicity occurred, as evidenced by "pinpoint" colonies, the high dose was lowered appropriately with serial dilution to attain six dose levels.

Metabolic Activation. The test substances were tested in the absence of metabolic activation, and with 5% and 10% (v/v) S9 in metabolic activation mix. The S9 preparation was added to the test substance/system/agar mixture prior to delivery to the bottom agar.

Endpoints. The primary endpoint was the number of revertant colonies, as counted on the plates following incubation.

MATERIALS AND METHODS

A. Specialized Materials

1. Test Substances

All fuels were supplied by David R. Mattie, PhD, 711 HPW/RHDJ.

Citgo JP8 (POSF 4658) *

Valero 25% Aromatic JP8 (POSF 8457) *

KiOR Hydrotreated Kerosene/Bio-Kerosene (POSF 10327) *

ARA ReadiJet (POSF 10328) *

Amyris Farnesane (POSF 10329) *

Virent HDO-SK (POSF 10330) *

TS-1 (Specification number 10227-86)

Gevo 7695 with JP8 additives (POSF 7699)

Gevo 10262 with JP8 additives (POSF 10263)

Swedish Biofuel 7633 with JP8 additives (POSF 8452)

* Denotes DLA sponsored fuel.

2. Solvent

Dimethyl sulfoxide (DMSO)

Manufacturer: American Type Culture Collection (ATCC; Manassas, VA)

Lot numbers: 30001060, 60950707

3. Positive Controls

2-Nitrofluorene

Manufacturer: Sigma-Aldrich (St. Louis, MO)

Lot number: S43858V

2-Anthramine

Manufacturer: Pfaltz & Bauer (Waterbury, CT)

Lot number: 19352

Sodium Azide

Manufacturer: Sigma-Aldrich (St. Louis, MO)

Lot number: MKBP4386V

9-Aminoacridine

Manufacturer: Sigma-Aldrich (St. Louis, MO)

Lot number: BCBK1177V

4-Nitroquinoline N-oxide

Manufacturer: Sigma-Aldrich (St. Louis, MO)

Lot number: SLBG4397V

4. Test Systems

Salmonella strains are described in Maron and Ames, 1983.

Strain: Salmonella typhimurium TA-98 (hisD3052, uvrB, rfa, pKM101)

Source: Moltox (Boone, NC)

DNA Target: -C-G-C-G-C-G-C-G-

Reversion event: Frameshifts

Strain: Salmonella typhimurium TA-100 (hisG46, uvrB, rfa, pKM101)

Source: Moltox (Boone, NC)

DNA Target: -G-G-G-

Reversion event: Base-pair substitution

Strain: Salmonella typhimurium TA-1535 (hisG46, uvrB, rfa)

Source: American Type Culture Collection (ATCC; Manassas, VA)

DNA Target: -G-G-G-

Reversion event: Base-pair substitution

Strain: Salmonella typhimurium TA-1537 ((his3076, uvrB, rfa)

Source: American Type Culture Collection (ATCC; Manassas, VA)

DNA Target: +1 frameshift (near -C-C-C- run)

Reversion event: Frameshifts

E. coli WP2 strain is described in Green and Muriel, 1976.

Strain: Escherichia coli WP2 (trp, uvrA)

Source: Moltox (Boone, NC)

DNA Target: A:T base pair

Reversion event: All possible transitions and transversions, small deletions

5. Metabolic Activation System

The metabolic activation system used was a cofactor supplemented post-mitochondrial fraction prepared from the livers of rodents treated with the enzyme-inducing agent Aroclor 1254 (S9; Moltox, Boone, NC; Lot number 3148).

B. Methods

1. Controls

Strain-specific positive and negative (solvent) controls, both with and without metabolic activation, were included in each assay, as well as an untreated control consisting of bacteria alone. Concentrations that demonstrate the effectiveness of the assay were selected. DMSO was used as

7

the negative (solvent) control for each trial. The S9 metabolic system diluted 5 and 10% in sterility plates were also evaluated, as was the sterility of each fuel.

2. Preparation of Bacteria

To prepare bacterial cultures for use in the assay, 50 ml of nutrient broth was inoculated and allowed to grow for approximately 15 to 18 hours at 37°C with constant agitation (125 rpm). Following 15 to 18 h of growth, cultures were removed from the shaker incubator and placed on ice. For *Salmonella* strains, minimal (bottom) agar plates containing Vogel-Bonner Medium E, dextrose, and trace amounts of histidine/biotin solution (to allow for limited cell division) were used to grow the bacteria exposed to the test substance. For *E. coli*, minimal agar plates containing Vogel-Bonner Medium E and dextrose were used to grow the bacteria exposed to the test substance. Additionally for *E. coli*, trace amounts (0.05 mM) of tryptophan was added to the molten top agar overlay, again to allow for limited cell division.

3. Doses

Based on results from *Salmonella typhimurium* TA-100, Citgo JP8 (POSF 4658), Valero 25% Aromatic JP8 (POSF 8457), ARA ReadiJet (POSF 10328), Amyris Farnesane (POSF 10329), TS-1 (Specification number 10227-86), Gevo 7695 with JP8 additives (POSF 7699), Gevo 10262 with JP8 additives (POSF 10263), and Swedish Biofuel 7633 with JP8 additives (POSF 8452), were used at 5, 2.5, 1.25, 0.625, 0.313 and 0.156 μl fuel/plate. Due to evidence of toxicity, KiOR Hydrotreated Kerosene/Bio-Kerosene (POSF 10327) and Virent HDO-SK (POSF 10330) were used at concentrations of 2.5, 1.25, 0.625, 0.313 μl, 0.156 and 0.078 μl fuel/plate. All fuels were prepared in appropriate volumes of DMSO immediately prior to use.

4. Experimental Procedure

Experiments and media/solution preparation followed standard procedures for the bacterial reverse mutation assay, as described in (Mortelmans and Zeiger, 2000). Briefly, for the plate incorporation method, without metabolic activation, $100~\mu l$ of the test substance (i.e., fuel diluted in DMSO to a total of $100~\mu l$) and $100~\mu l$ of fresh bacterial culture were added to autoclaved overlay

agar (2.5 ml) in glass test tubes with metal closures. When S9 was added for metabolic activation, 500 µl of the metabolic activation mixture (containing either 5 or 10% S9) was added to the overlay agar in the glass test tube, with the bacteria and test substance. For *E. coli* only, 0.05 mM tryptophan was also added to the overlay agar. The entire contents of the tubes were mixed and poured over the surface of the minimal (bottom) agar plates. The overlay agar was allowed to solidify prior to inversion of the plates and incubation. Triplicate plating was used at each dose level. All plates were incubated at 37°C for 48 to 72 hours. Plates that were not counted immediately following the incubation period were stored at 4°C to halt any further bacterial growth until enumeration of colonies.

C. Data Collection and Archiving

The number of revertant colonies were counted and recorded for each plate by NAMRU-D personnel. Plates were randomized to avoid any potential bias associated with individuals. Hard copies of the raw data will be stored at NAMRU-D for at least 1 year, and digital/scanned copies of the raw data will be stored at NAMRU-D for at least a period of 3 years.

D. Statistical Methods

The mutant frequency was expressed as the quotient of the number of revertant colonies over the number of colonies in the solvent control. A mutagenic potential of the test substance was assumed if the mutant frequency was at least 2.0 or higher, with increases occurring in a dosedependent manner.

All data were analyzed using SigmaPlot for Windows version 12.5.0.38 (2011). Means and standard deviation were calculated from the individual plate counts. Prior to analyses, SigmaPlot was used to run the Levene's test to check for equality of variances and the Shapiro-Wilk test to check for normality of data distribution. When data met the criterion for equal variance and normality, a one-way analysis of variance (ANOVA) was performed to assess differences between groups. If significant difference existed between groups, a Dunnett post-hoc analysis was performed to compare individual dose group means with the controls. When assumptions for equal

variance and normality failed, a Kruskal-Wallis ANOVA on ranks was performed. For all analyses, significance levels were set at p < 0.05.

E. Interpretation of Positive vs. Negative Result

The mutant frequency was expressed as the quotient of the number of revertant colonies over the number of colonies in the solvent control. Mutagenic potential of the test substance was assumed if the mutant frequency was 2.0 or higher (two-fold increase in number of revertant colonies). This minimum 2-fold increase is a widely used approach for categorizing mutagenic versus nonmutagenic substances. Many researchers set more strict guidelines and require a 3-fold increase in revertant colonies. Alternatively, non-statistical criteria qualify "positive" results by a reproducible, dose-dependent increase in the number of revertant colonies in one or more test strains. "Negative" results suggest a substance is nonmutagenic if no dose-dependent increase is observed (Mortelmans and Zeiger, 2000). Both of these approaches were used to analyze the data for this study.

RESULTS AND DISCUSSION

A. Preliminary Assessment of Toxicity (Range-Finding)

Primary assessments regarding the cytotoxicity of test substances are typically made using *Salmonella typhimurium* strain TA-100. As such, initial experiments were performed using this strain to determine if the maximum recommended dose of 5 μl/plate was suitable for these test substances. These experiments demonstrated that 5 μl/plate was an appropriate high dose for 8 of the 10 fuels: Citgo JP8 (POSF 4658), Valero 25% Aromatic JP8 (POSF 8457), ARA ReadiJet (POSF 10328), Amyris Farnesane (POSF 10329), TS-1 (Specification number 10227-86), Gevo 7695 with JP8 additives (POSF 7699), Gevo 10262 with JP8 additives (POSF 10263), and Swedish Biofuel 7633 with JP8 additives (POSF 8452). There were no observations of any significant precipitation, nor any evidence of cytotoxicity at any of the concentrations tested for these eight jet fuels. Given that 5 μl fuel/plate was deemed suitable as a maximum dose, the additional doses for further testing were 5, 2.5, 1.25, 0.625, 0.313, and 0.078 μl fuel/ plate.

Two of the jet fuels tested, KiOR Hydrotreated Kerosene/Bio-Kerosene (POSF 10327) and Virent HDO-SK (POSF 10330), demonstrated cytotoxic characteristics at the 5 µl/plate dose, as

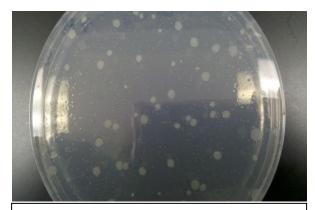


Figure 1: "Pinpoint" colonies of <code>Salmonella</code> TA-100 induced by exposure to 5 μ l/plate KiOR Hydrotreated Kerosene/Bio-Kerosene (POSF 10327). Larger colonies are of standard size for revertant TA-100 colonies; the smaller colonies are abnormal and are indicative of toxicity at this dose.

evidenced by the presence of hundreds of "pinpoint" colonies. These colonies were significantly smaller, approximately a tenth of the size or less, when compared to otherwise normal colonies (Figure 1).

Pinpoint colonies are considered a result of a "high level of toxicity". This toxicity results in the early death of the many bacteria, eliminating the normal

background "lawn" and leaving more of the trace histidine available for surviving non-revertants. Ultimately, this allows non-revertants to undergo further cell division, yielding very small colonies, until trace histidine is fully exhausted (Mortelmans and Zeiger, 2000). Given the abundance of pinpoint colonies at the 5 µl fuel/plate dose, the doses were adjusted such that 2.5 µl fuel/plate would be used as the high dose for these two fuels, which greatly reduced the presence of pinpoint colonies. As such, the concentrations for KiOR Hydrotreated Kerosene/Bio-Kerosene (POSF 10327) and Virent HDO-SK (POSF 10330) were 2.5, 1.25, 0.625, 0.313, 0.156 and 0.078 µl fuel/plate.

B. Mutagenicity Experiments

Mutagenicity experiments were conducted in absence and presence of metabolic activation (5 and 10% S9) with all five strains of bacteria across six fuel doses. Jet fuels were dissolved in DMSO immediately prior to use. The fuels readily went into solution in DMSO; however, a "hazy film" or "cloudiness" was observed when the fuels (in DMSO) were added to the agar overlay mixture. This was to be expected, as fuels typically do not readily go into a water-based solution. This cloudy haze was most apparent with the two highest doses and became less visible with less

concentrated doses. There were no observations noted concerning the formation of precipitates or the distinct layering into separate fuel/water phases that may have caused particular concern with regard to appropriate mixing/interaction.

Raw colony counts and mutant frequencies (shown as the ratio of fuel-treated to solvent control colonies) for each fuel are shown in Tables 1-50 (pages 15-64). Statistical analyses using ANOVA did reveal some statistically significant differences between certain fuels/doses in comparison to the solvent control; these values are shown in bold, where appropriate, in Tables 1-50. While some statistical significant differences did exist, they were not associated with a 2-fold or greater increase in revertant colonies or a dose-dependent increase in revertant colonies, as described in Section III. B.

Case in point, on numerous occasions, data sets (such as in Table 20, page 34) show only one or two statistically significant dose(s). While statistically significant, the data do not correlate to an increase in mutant frequency and the significant data point(s) are with regard to intermediate dose levels only (0.313 μ l/plate in the case of Table 20, page 34), and are therefore not suggestive of a dose-response. In these cases, these statistically significant differences are neither of mutagenic or biological relevance.

Further, Table 2 (page 16) displays the results for *Salmonella* TA-100 following exposure to Citgo JP8 (POSF 4658). There was a statistically significant difference in the mean plate count when the test strain was exposed to 0.313 (or greater) µl Citgo JP8 /plate. While significant, there was largely no change in the mutant frequency, and the mean number of colonies decreased with increase in dose. This opposite dose-response effect may be more suggestive of a cytotoxic effect. Therefore, while statistically significant, these results are not considered to be an indication of a mutagenic response.

As described above, there was a cytotoxic effect associated with the 5 μ l/plate dose for KiOR Hydrotreated Kerosene/Bio-Kerosene (POSF 10327) and Virent HDO-SK (POSF 10330). This is not an abnormal effect given that complex mixtures, such as jet fuels, may contain specific

components at concentrations high enough to elicit a cytotoxic effect against bacteria. Whether this cytotoxic effect on prokaryotic cells would translate to a cytotoxic effect on eukaryotic cells cannot be determined from this study. Overall, while the raw colony counts and mutant frequencies fluctuate slightly within normal expectations, the criteria (as outlined in Section III. B) for classifying the 10 jet fuels used in this study as potential mutagens are not met.

CONCLUSIONS

All of the ten jet fuels tested were considered to be negative for mutagenicity in the bacterial reverse mutation assay using *Salmonella* and *E. coli* strains. KiOR Hydrotreated Kerosene/Bio-Kerosene (POSF 10327) and Virent HDO-SK (POSF 10330) were found to be cytotoxic to the bacteria at the maximum dose (5 μl/plate). Based on the parameters used in this *in vitro* study, Citgo JP8 (POSF 4658), Valero 25% Aromatic JP8 (POSF 8457), KiOR Hydrotreated Kerosene/Bio-Kerosene (POSF 10327), ARA ReadiJet (POSF 10328), Amyris Farnesane (POSF 10329), Virent HDO-SK (POSF 10330), TS-1 (Specification number 10227-86), Gevo 7695 with JP8 additives (POSF 7699), Gevo 10262 with JP8 additives (POSF 10263), and Swedish Biofuel 7633 with JP8 additives (POSF 8452) are considered to be nonmutagenic.

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Table 1: Individual and mean plate counts for Salmonella TA-98 exposed to Citgo JP8 (POSF 4658)

compound without met	tabolic activation:		11/5/2013	3					
						Ratio			
				M ean Plate	Standard	Treated /	1		
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ıal Plate	
TA-98	-	Citgo JP8	5.000	35.33	4.04	1.1	33	33	4
	-	Citgo JP8	2.500	26.00	5.20	0.8	20	29	2
	-	Citgo JP8	1.250	30.67	8.39	1.0	21	35	3
	-	Citgo JP8	0.625	34.00	1.00	1.1	35	34	3
	-	Citgo JP8	0.313	42.00	5.29	1.3	48	38	4
	-	Citgo JP8	0.156	36.33	4.62	1.1	39	39	3
compound with metabo	lic activation:		11/5/2013	Percent S9:	5%				
						Ratio			
				Mean Plate	Standard	Treated /	İ		
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Coun
TA-98	+(5%)	Citgo JP8	5.000	35.67	16.62	0.8	18	38	5
	+(5%)	Citgo JP8	2.500	44.67	8.50	1.0	45	36	5
	+(5%)	Citgo JP8	1.250	41.00	4.24	0.9	44	34	3
	+(5%)	Citgo JP8	0.625	44.67	4.04	1.0	44	41	4
	+(5%)	Citgo JP8	0.313	44.00	11.14	1.0	42	56	3
	+(5%)	Citgo JP8	0.156	42.50	2.12	1.0	44	41	N
	. (070)	0.1g0 01 0	3.00	.2.00					
compound with metabo	olic activation:	·	11/5/201	Percent S9:	10%				
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				M ean Plate	Standard	Treated /	İ		
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	Cour
TA-98	+(10%)	Citgo JP8	5.000	43.33	2.52	0.9	46	43	4
TA-30	+(10%)	Citgo JP8	2.500	50.00	3.61	1.0	53	51	4
	+(10%)	Citgo JP8	1.250	43.67	7.57	0.9	47	35	4
	+(10%)	Citgo JP8	0.625	44.00	4.58	0.9	49	40	4
	+(10%)			43.00	4.58			48	4
	+(10%)	Citgo JP8	0.313 0.156	47.67	4.58 8.08	0.9 1.0	39 55	39	4
	+(10%)	Citgo JP8	0.86	47.07	0.00	1.0	- 55	39	4
tive control without ma	tabalia aativatia n		1/5/2013)					
tive control without me	tabolic activation		IV5/20 k	1		Ratio			
				Mean Plate	Standard	Treated /	ĺ		
T C4	60 (()		Dana man mlata ()		Deviation		I marking indi	.al Diata	^
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count		Solvent		ual Plate	
TA-98	-	2-Nitrofluorene	3	230.33	27.57	7.3	228	204	2
	-	Untreated		34.67	9.07	1.1	43	36	2
	-	Solvent		31.67	1.53		30	33	3
ting against with a state	a lia a ativatia d		MEIOON	D + C	F0/				
tive control with metab	olic activation:	1	175/201	Percent S9:	3%	Davi-			
	1			l		Ratio	ĺ		
				M ean Plate	Standard	Treated /			_
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent		ual Plate	
TA-98	+(5%)	2-Anthramine	0.5	248.33	19.14	5.6	264	227	2
	+(5%)	Untreated		48.00	12.00	1.1	36	48	6
	+(5%)	Solvent		44.67	6.35		41	41	5
tive control with metab	olic activation:		11/5/2013	Percent S9:	10%				
	1					Ratio	ĺ		
	1			M ean Plate	Standard	Treated /	ĺ		
	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent		ual Plate	
Tester Strain			0.5	136.33	11.24	2.8	139	124	14
Tester Strain	+(10%)	2-Anthramine	0.0			4.0	- 10		
		2-Anthramine Untreated	0.0	50.00	2.00	1.0	48	52	
	+(10%)			50.00 48.67	2.00	1.0	48 51	52 48	5 4
	+(10%) +(10%)	Untreated	0.0			1.0			

Table 2: Individual and mean plate counts for Salmonella TA-100 exposed to Citgo JP8 (POSF 4658)

compound without met	abolic activation		10/18/2013	3					
						Ratio			
	1			M ean Plate	Standard	Treated /	1		
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	<u>C o</u> un
TA-100	-	Citgo JP8	5.000	103.00	5.00	0.8	108	98	10
	-	Citgo JP8	2.500	107.33	15.14	0.9	114	118	90
	-	Citgo JP8	1.250	121.33	3.06	1.0	118	122	12
	-	Citgo JP8	0.625	121.00	5.57	1.0	126	115	12
	-	Citgo JP8	0.313	135.33	9.02	1,1	136	126	14
	-	Citgo JP8	0.156	116.33	16.65	0.9	135	111	10
		ungu u							
compound with metabo	lic activation:		10/18/2013	Percent S9:	5%				
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	Coun
TA-100	+(5%)	Citgo JP8	5.000	89.33	4.73	0.7	91	93	84
17-100	+(5%)	Citgo JP8	2.500	94.00	9.64	0.8	101	83	98
	+(5%)	Citgo JP8	1.250	105.33	3.79	0.9	108	101	10
	+(5%)	Citgo JP8	0.625	106.33	6.03	0.9	107	100	112
							107	100	10
	+(5%)	Citgo JP8	0.313	105.33	2.89	0.9			
	+(5%)	Citgo JP8	0.156	111.00	2.00	0.9	109	111	11
	Parado de la companya della companya della companya de la companya de la companya della companya		40 / 10 / 10 0	D	40.07				
compound with metabo	iic activation:		10/18/2013	Percent S9:	10%				
						Ratio			
				Mean Plate	Standard	Treated /			_
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent		ual Plate	
TA-100	+(10%)	Citgo JP8	5.000	98.33	16.20	0.8	88	90	117
	+(10%)	Citgo JP8	2.500	114.67	11.72	0.9	110	106	12
	+(10%)	Citgo JP8	1.250	129.67	12.10	1.0	134	116	13
	+(10%)	Citgo JP8	0.625	120.67	11.59	1.0	113	115	13
	+(10%)	Citgo JP8	0.313	118.33	3.21	0.9	117	116	12
	+(10%)	Citgo JP8	0.156	105.33	9.87	8.0	110	112	94
itive control without met	abolic activation	:	10/18/2013	3					
						Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individu	ual Plate	Count
TA-100	-	Sodium Azide	3	2236.00	86.53	18.0	2164	2212	233
	-	Untreated		121.67	3.06	1.0	121	119	12
	-	Solvent		124.00	13.53		123	111	13
itive control with metabo	lic activation:		10/18/2013	Percent S9:	5%				
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individ	ual Plate	Coun
TA-100	+(5%)	2-Anthramine	0.5	357.00	38.97	3.0	392	364	31
17. 100	+(5%)	Untreated	5.5	144.33	7.51	1.2	153	140	14
	+(5%)	Solvent		119.67	3.06	1.4	119	123	11
	T(3%)	COLVELIE		113.07	3.00		113	<u>⊬</u> 3	(1)
itivo control with motals	lie activeties:		40/40/00#	Dorocht Co.	10.9/				
itive control with metabo	nic activation:		10/18/201	Percent S9:	10 %	D-41-			
					0	Ratio			
T	0011		.	Mean Plate	Standard	Treated /			•
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent		ial Plate	
TA-100	+(10%)	2-Anthramine	0.5	263.50	13.44	2.1	254	273	N/
	+(10%)	Untreated		132.00	4.36	1.0	129	130	13
	+(10%)	Solvent		127.00	2.65		129	128	12
			on, was not included in mean o						

Table 3: Individual and mean plate counts for Salmonella TA-1535 exposed to Citgo JP8 (POSF 4658)

Tester Strain TA-1535	S9 (-/+)								
		Test Fuel	Dose per plate (uL)	M ean Plate Count	Standard Deviation	Ratio Treated / Solvent	Individ	ual Plate	Count
		Citgo JP8	5.000	8.00	3.61	0.8	7	5	12
	-	Citgo JP8	2.500	5.67	153	0.5	7	4	6
	-	Citgo JP8	1.250	9.33	3.51	0.9	9	13	6
	-	Citgo JP8	0.625	13.67	13.28	1.3	6	6	29
	-		0.313	9.00	0.00	0.9	9	9	9
	_	Citgo JP8							
	-	Citgo JP8	0.156	6.67	0.58	0.6	6	7	7
t compound with metabol	ic activation:		10/22/201	Percent S9:	5%				
	1		10,			Ratio			
Tootor Strain	S9 (-/+)	Test Fuel	Dogo por ploto (ul.)	Mean Plate Count	Standard Deviation	Treated / Solvent	Individu	ual Plate	Caun
Tester Strain			Dose per plate (uL)						
TA-1535	+(5%)	Citgo JP8	5.000	10.33	4.04	1.1	11	6	14
	+(5%)	Citgo JP8	2.500	8.50	2.12	0.9	10	NA	7
	+(5%)	Citgo JP8	1.250	13.50	4.95	1.5	10	NA	17
	+(5%)	Citgo JP8	0.625	15.00	3.61	1.7	16	11	18
	+(5%)	Citgo JP8	0.313	11.00	2.65	1.2	14	10	9
	+(5%)	Citgo JP8	0.156	12.00	2.00	1.3	10	14	12
t compound with metabol	ic activation:		12/10/201	Percent S9:	10%				
				M ean Plate	Standard	Ratio Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent		ual Plate	
TA-1535	+(10%)	Citgo JP8	5.000	11.33	1.53	1.3	10	13	11
	+(10%)	Citgo JP8	2.500	13.00	3.46	1.4	11	17	1
	+(10%)	Citgo JP8	1.250	10.67	1.53	1.2	11	9	12
	+(10%)	Citgo JP8	0.625	8.67	1.53	1.0	10	7	9
	+(10%)	Citgo JP8	0.313	7.67	4.04	0.9	4	12	7
	+(10%)	Citgo JP8	0.156	11.33	2.52	1.3	9	14	11
sitive control without meta	bolic activation	:	11/22/201	3	1				
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individu	ual Plate	Coun
TA-1535	-	Sodium Azide	3	564.00	32.19	54.6	560	534	59
	-	Untreated		14.33	5.13	1.4	13	20	10
	-	Solvent		10.33	4.04		14	11	6
sitive control with metabol	ic activation:		10/22/201	Percent S9:	5%				
						Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individ	ual Plate	Coun
TA-1535	+(5%)	2-Anthramine	0.5	35.67	1.53	4.0	37	36	34
	+(5%)	Untreated		13.67	2.31	1.5	15	15	11
	+(5%)	Solvent		9.00	2.65		10	6	11
	, , ,								
	ic activation:		12/10/201	Percent S9:	10%				
sitive control with metabol	1			M ean Plate	Standard	Ratio Treated /			
sitive control with metabol					Deviation	Solvent	Individu		_
	S9 (-/+)	Compound	Dose per plate (ug)						Count
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count				ual Plate	
	+(10%)	2-Anthramine	Dose per plate (ug) 0.5	33.00	2.65	3.7	36	31	32
Tester Strain	+(10%) +(10%)	2-Anthramine Untreated		33.00 15.00	2.65 1.00		36 14	31 15	32 16
Tester Strain	+(10%)	2-Anthramine		33.00	2.65	3.7	36	31	32 16
Tester Strain TA-1535	+(10%) +(10%) +(10%)	2-Anthramine Untreated Solvent		33.00 15.00 9.00	2.65 1.00 2.00	3.7	36 14	31 15	32 16

Table 4: Individual and mean plate counts for Salmonella TA-1537 exposed to Citgo JP8 (POSF 4658)

st compound without met	abolic activation:		10/28/2013	3					
						Ratio			
				M ean Plate	Standard	Treated /	1		
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Coun
TA-1537	- '	Citgo JP8	5.000	19.33	5.69	1.2	24	21	1
	-	Citgo JP8	2.500	18.33	6.43	1.2	11	21	2
	-	Citgo JP8	1.250	16.67	2.31	1.1	18	14	18
	-	Citgo JP8	0.625	11.33	4.04	0.7	12	15	7
	-	Citgo JP8	0.313	13.00	0.00	0.8	13	13	1
	_	Citgo JP8	0.156	15.00	1.00	1.0	16	15	1/
		enge er e	0.100	10.00					
st compound with metabo	olic activation:		10/28/2013	Percent S9:	5%				
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	Coun
TA-1537	+(5%)	Citgo JP8	5.000	18.67	3.06	0.9	22	18	16
1A-037			2.500	19.00	3.61	1.0		22	2
	+(5%)	Citgo JP8					15		
	+(5%)	Citgo JP8	1.250	22.50	0.71	1.1	22	22	2
	+(5%)	Citgo JP8	0.625	13.00	2.65	0.7	10	15	1
	+(5%)	Citgo JP8	0.313	17.67	3.21	0.9	14	20	1:
	+(5%)	Citgo JP8	0.156	18.00	2.65	0.9	19	15	2
st compound with metabo	olic activation:		10/28/2013	Percent S9:	10%				
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ıal Plate	Coun
TA-1537	+(10%)	Citgo JP8	5.000	27.67	5.51	1.4	25	34	2
	+(10%)	Citgo JP8	2.500	14.33	6.11	0.7	21	9	1
	+(10%)	Citgo JP8	1.250	20.00	5.20	1.0	26	17	17
	+(10%)	Citgo JP8	0.625	15.33	3.79	0.8	11	17	1
	+(10%)	Citgo JP8	0.313	14.50	0.71	0.7	15	14	N.
	+(10%)	Citgo JP8	0.156	18.33	5.51	0.9	21	22	12
sitive control without me	tabolic activation		10/28/2013	3					
						Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individ	ual Plate	Coun
TA-1537		9-Amino acridine	100	1304.67	323.71	83.3	1640	1280	99
	-	Untreated		20.67	2.89	1,3	19	24	19
	_	Solvent		15.67	0.58		15	16	1
		COIVEIL		5.07	0.50				-
sitive control with metabo	alic activation:		10/29/2015	Percent S9:	5%				
			10/20/20 8	l cicelli 39.	J 70	Ratio	1		
Silive Control with metabl	one detivation.						1		
silive control with metable				Moon Blots	Ctandard	Troated/			C
		Company	Daga nor state (v.c.)	Mean Plate	Standard	Treated /	In all set of		coun
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individ		-
	S9 (-/+) +(5%)	2-Anthramine	Dose per plate (ug)	Count 55.67	Deviation 2.52	Solvent 2.8	56	58	_
Tester Strain	S9 (-/+) +(5%) +(5%)	2-Anthramine Untreated		Count 55.67 22.67	2.52 5.03	Solvent	56 18	58 28	2
Tester Strain	S9 (-/+) +(5%)	2-Anthramine		Count 55.67	Deviation 2.52	Solvent 2.8	56	58	5; 2; 2
Tester Strain TA-1537	\$9 (-/+) +(5%) +(5%) +(5%)	2-Anthramine Untreated	3	55.67 22.67 20.00	2.52 5.03 100	Solvent 2.8	56 18	58 28	2
Tester Strain	\$9 (-/+) +(5%) +(5%) +(5%)	2-Anthramine Untreated	3	Count 55.67 22.67	2.52 5.03 100	2.8 1.1	56 18	58 28	2
Tester Strain TA-1537	\$9 (-/+) +(5%) +(5%) +(5%)	2-Anthramine Untreated	3	Count 55.67 22.67 20.00 Percent S9:	2.52 5.03 1.00	Solvent 2.8 1.1 Ratio	56 18	58 28	2
Tester Strain TA-1537	\$9 (-/+) +(5%) +(5%) +(5%)	2-Anthramine Untreated	3	55.67 22.67 20.00	2.52 5.03 100	2.8 1.1	56 18	58 28	2
Tester Strain TA-1537	\$9 (-/+) +(5%) +(5%) +(5%)	2-Anthramine Untreated	3	Count 55.67 22.67 20.00 Percent S9:	2.52 5.03 1.00	Solvent 2.8 1.1 Ratio	56 18 20	58 28	2
Tester Strain TA-1537 sitive control with metabo	\$9 (-/+) +(5%) +(5%) +(5%) +(5%)	2-Anthramine Untreated Solvent	10/28/2013	Count 55.67 22.67 20.00 Percent S9:	2.52 5.03 1.00 10% Standard	2.8 1.1 Ratio Treated /	56 18 20	58 28 19	Coun
Tester Strain TA-1537 sitive control with metabo	\$9 (-/+) +(5%) +(5%) +(5%) Dic activation:	2-Anthramine Untreated Solvent	10/28/2015 Dose per plate (ug)	Count 55.67 22.67 20.00 Percent S9:	2.52 5.03 1.00 10% Standard Deviation	2.8 1.1 Ratio Treated / Solvent	56 18 20 Individ	58 28 19	2 2 2 C o un 4
Tester Strain TA-1537 sitive control with metabo	\$9 (-/+) +(5%) +(5%) +(5%) +(5%) Dic activation: \$9 (-/+) +(10%) +(10%)	2-Anthramine Untreated Solvent Compound 2-Anthramine	10/28/2015 Dose per plate (ug)	Count 55.67 22.67 20.00 Percent S9: Mean Plate Count 42.33	2.52 5.03 100 10% Standard Deviation 2.31	Ratio Treated / Solvent 2.2	56 18 20 Individe 45	58 28 19	22
Tester Strain TA-1537 sitive control with metabo	\$9 (-/+) +(5%) +(5%) +(5%) blic activation: \$9 (-/+) +(10%)	2-Anthramine Untreated Solvent Compound 2-Anthramine Untreated	10/28/2015 Dose per plate (ug)	Count 55.67 22.67 20.00 Percent S9: Mean Plate Count 42.33 26.00	2.52 5.03 100 10% Standard Deviation 2.31 5.20	Ratio Treated / Solvent 2.2	56 18 20 Individe 45 29	58 28 19 19 Jal Plate 41 29	22 2 Coun 4

Table 5: Individual and mean plate counts for E. coli WP2 exposed to Citgo JP8 (POSF 4658)

compound without met	abolic activation:		12/3/201	3					
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Cour
WP2	-	Citgo JP8	5.000	39.00	7.55	0.8	40	46	3
	-	Citgo JP8	2.500	45.33	10.50	0.9	56	35	4
	-	Citgo JP8	1.250	48.00	1.73	1.0	49	46	4
	-	Citgo JP8	0.625	50.67	3.06	1,1	48	54	5
	-	Citgo JP8	0.313	37.33	10.12	0.8	31	32	4
	_	Citgo JP8	0.156	37.00	6.93	0.8	29	41	4
		enge er e	5.100	01100	0.00	0.0			
compound with metabo	lic activation:		12/3/201	3 Percent S9:	5%				
oompound mannotabe	, no dottration:		2, 0, 20	1	0 ,0	Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Caur
WP2	+(5%)	Citgo JP8	5.000	50.67	14.05	0.8	52	36	6
VVPZ			2.500	58.00	5.29	0.8	62	60	5
	+(5%)	Citgo JP8							
	+(5%)	Citgo JP8	1.250	59.67	2.31	0.9	61	57	6
	+(5%)	Citgo JP8	0.625	66.00	9.17	1.0	74	68	5
	+(5%)	Citgo JP8	0.313	66.33	7.09	1.0	60	74	6
	+(5%)	Citgo JP8	0.156	55.33	8.08	0.9	54	48	6
compound with metabo	lic activation:		12/3/201	3 Percent S9:	10 %				
				1		Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Cour
WP2	+(10%)	Citgo JP8	5.000	59.67	21.78	1.2	42	84	5
	+(10%)	Citgo JP8	2.500	64.00	0.00	1.2	64	64	6
	+(10%)	Citgo JP8	1.250	61.33	11.15	1.2	53	57	7
	+(10%)	Citgo JP8	0.625	54.33	10.69	1.1	66	52	4
	+(10%)	Citgo JP8	0.313	59.67	5.51	1.2	60	54	6
	+(10%)	Citgo JP8	0.156	56.67	7.02	1.1	50	64	5
itive control without me	tabolic activation		12/3/201	3					
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individ	ual Plate	Coun
WP2	-	4NQO	2.5	1181.33	12.86	24.6	1172	1176	11:
-	-	Untreated		40.67	3.51	0.8	41	37	4
	1 -	Solvent		48.00	3.61	3.0	51	49	4
		CONVOIR		40.00	0.01		<u> </u>	75	+-
itive control with metabo	olic activation:		12/2/201	3 Percent S9:	5%				
in Control with Hetabl	Jilo dottvation.		12/3/201	l cicciii 33.	J 70	Ratio			
				M ean Plate	Standard	Treated /	1		
Tootor Ctrain	60 (()	camra	Desc per plate ()	Count	Deviation		الدائدة والما	ual Diate	C
Tester Strain WP2	S9 (-/+)	Compound 2-Anthramine	Dose per plate (ug)	652.00	78.08	Solvent	648	ual Plate 576	
VVPZ	+(5%)		∠∪			10.1			7:
	+(5%)	Untreated		64.67	14.19	1.0	52	80	6
	+(5%)	Solvent		64.33	9.07		56	63	7
itive control with metabo	olic activation:	, ,	12/3/201	3 Percent S9:	10%				
				1		Ratio			
				M ean Plate	Standard	Treated /			
T (0 (1 -	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent		ual Plate	
Tester Strain	+(10%)	2-Anthramine	20	614.67	90.89	11.9	712	600	5
WP2		Untreated		61.00	1.73	1.2	62	59	6
	+(10%)	Untreated							
	+(10%) +(10%)	Solvent		51.67	13.58		66	50	3
					13.58		66	50	3

Table 6: Individual and mean plate counts for Salmonella TA-98 exposed to Valero 25% Aromatic JP8 (POSF 8457)

	tabolic activation:	1	11/5/2013			Ratio	ı		
				Mean Plate	Standard	Treated /			
									_
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent		ual Plate	
TA-98	-	Valero	5.000	25.00	1.00	8.0	24	26	2
	-	Valero	2.500	28.00	3.61	0.9	25	27	32
	-	Valero	1.250	31.67	8.02	1.0	24	31	40
	-	Valero	0.625	40.67	4.93	1.3	43	35	44
	-	Valero	0.313	29.33	8.62	0.9	37	31	20
	-	Valero	0.156	34.67	8.08	1.1	36	26	42
compound with metabo	olic activation:		11/5/2013	Percent S9:	5%				
		I I				Ratio	l		
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	Coun
TA-98	+(5%)	Valero	5.000	34.67	6.11	0.8	36	28	40
1 A-98									
	+(5%)	Valero	2.500	33.67	4.73	0.8	32	30	39
	+(5%)	Valero	1.250	33.00	7.00	0.7	30	28	4
	+(5%)	Valero	0.625	43.00	5.29	1.0	39	49	4
	+(5%)	Valero	0.313	46.67	6.66	1.0	50	39	5
	+(5%)	Valero	0.156	43.67	14.19	1.0	31	59	4
compound with metabo	olic activation:		11/5/2013	Percent S9:	10%				
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Count
TA-98	+(10%)	Valero	5.000	37.33	9.71	0.8	48	35	29
17-30	+(10%)	Valero	2.500	41.00	2.65	0.8	39	44	4(
								44	
	+(10%)	Valero	1.250	43.33	13.01	0.9	56		30
	+(10%)	Valero	0.625	43.00	4.24	0.9	NA	40	46
	+(10%)	Valero	0.313	56.00	4.00	1.2	56	52	60
	+(10%)	Valero	0.156	45.00	5.29	0.9	49	47	39
tive control without met	tabolic activation		11/5/2013						
						Ratio			
		ı I		M ean Plate	Standard	Treated /	1		
							Individu	ual Plate	Count
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	IIIuiviai		
	S9 (-/+)		Dose per plate (ug)						25
Tester Strain TA-98	S9 (-/+)	2-Nitrofluorene	Dose per plate (ug) 3	230.33	27.57	7.3	228	204	
		2-Nitrofluorene Untreated		230.33 34.67	27.57 9.07		228 43	204 36	25
	-	2-Nitrofluorene		230.33	27.57	7.3	228	204	25
TA-98		2-Nitrofluorene Untreated	3	230.33 34.67 31.67	27.57 9.07 153	7.3	228 43	204 36	25
		2-Nitrofluorene Untreated	3	230.33 34.67	27.57 9.07 153	7.3 1.1	228 43	204 36	25
TA-98		2-Nitrofluorene Untreated	3	230.33 34.67 31.67 Percent \$9:	27.57 9.07 153 5%	7.3 1.1 Ratio	228 43	204 36	25
TA-98 tive control with metabo	- - - olic activation:	2-Nitrofluorene Untreated Solvent	3 1//5/2013	230.33 34.67 3167 Percent S9:	27.57 9.07 153 5% Standard	7.3 1.1 Ratio Treated /	228 43 30	204 36 33	32
TA-98 tive control with metabo	olic activation:	2-Nitrofluorene Untreated Solvent	3 1//5/2013 Dose per plate (ug)	230.33 34.67 3167 Percent S9: Mean Plate Count	27.57 9.07 153 5% Standard Deviation	7.3 1.1 Ratio Treated / Solvent	228 43 30	204 36 33	32 Count
TA-98 tive control with metabo	- - - - blic activation: \$9 (-/+) +(5%)	2-Nitrofluorene Untreated Solvent Compound 2-Anthramine	3 1//5/2013	230.33 34.67 3167 Percent S9: Mean Plate Count 248.33	27.57 9.07 153 5% Standard Deviation 19.14	Ratio Treated / Solvent 5.6	228 43 30 Individe 264	204 36 33 33 ual Plate 227	25 32 Count
TA-98 tive control with metabo		2-Nitrofluorene Untreated Solvent Compound 2-Anthramine Untreated	3 1//5/2013 Dose per plate (ug)	230.33 34.67 3167 Percent S9: Mean Plate Count 248.33 48.00	27.57 9.07 153 5% Standard Deviation 19.14 12.00	7.3 1.1 Ratio Treated / Solvent	228 43 30 Individe 264 36	204 36 33 ual Plate 227 48	25 32 Coun 25 60
TA-98 tive control with metabo	- - - - blic activation: \$9 (-/+) +(5%)	2-Nitrofluorene Untreated Solvent Compound 2-Anthramine	3 1//5/2013 Dose per plate (ug)	230.33 34.67 3167 Percent S9: Mean Plate Count 248.33	27.57 9.07 153 5% Standard Deviation 19.14	Ratio Treated / Solvent 5.6	228 43 30 Individe 264	204 36 33 33 ual Plate 227	25 32 Coun 25 60
TA-98 tive control with metabo		2-Nitrofluorene Untreated Solvent Compound 2-Anthramine Untreated	3 1//5/2013 Dose per plate (ug)	230.33 34.67 3167 Percent S9: Mean Plate Count 248.33 48.00	27.57 9.07 153 5% Standard Deviation 19.14 12.00	Ratio Treated / Solvent 5.6	228 43 30 Individe 264 36	204 36 33 ual Plate 227 48	25 32 Count 25 60
TA-98 tive control with metabo		2-Nitrofluorene Untreated Solvent Compound 2-Anthramine Untreated	3 11/5/2013 Dose per plate (ug) 0.5	230.33 34.67 3167 Percent S9: Mean Plate Count 248.33 48.00	27.57 9.07 153 5% Standard Deviation 19.14 12.00 6.35	Ratio Treated / Solvent 5.6	228 43 30 Individe 264 36	204 36 33 ual Plate 227 48	25 32 Count 25 60
TA-98 tive control with metabout Tester Strain TA-98	- - - - - - - - - - - - - - - - - - -	2-Nitrofluorene Untreated Solvent Compound 2-Anthramine Untreated	3 11/5/2013 Dose per plate (ug) 0.5	230.33 34.67 3167 Percent S9: Mean Plate Count 248.33 48.00 44.67	27.57 9.07 153 5% Standard Deviation 19.14 12.00 6.35	Ratio Treated / Solvent 5.6	228 43 30 Individe 264 36	204 36 33 ual Plate 227 48	25 32 Count 25 60
TA-98 tive control with metabout Tester Strain TA-98	- - - - - - - - - - - - - - - - - - -	2-Nitrofluorene Untreated Solvent Compound 2-Anthramine Untreated	3 11/5/2013 Dose per plate (ug) 0.5	230.33 34.67 3167 Percent S9: Mean Plate Count 248.33 48.00 44.67 Percent S9:	27.57 9.07 153 5% Standard Deviation 19.14 12.00 6.35	7.3 1.1 Ratio Treated / Solvent 5.6 1.1 Ratio	228 43 30 Individe 264 36	204 36 33 ual Plate 227 48	25 32 Coun 25 60
TA-98 tive control with metabolic Tester Strain TA-98		2-Nitrofluorene Untreated Solvent Compound 2-Anthramine Untreated Solvent	3 11/5/2013 Dose per plate (ug) 0.5	230.33 34.67 3167 Percent S9: Mean Plate Count 248.33 48.00 44.67 Percent S9: Mean Plate	27.57 9.07 153 5% Standard Deviation 19.14 12.00 6.35 10% Standard	7.3 1.1 Ratio Treated / Solvent 5.6 1.1 Ratio Treated /	228 43 30 Individe 264 36 41	204 36 33 33 ual Plate 227 48 41	25 32 Coun 25 60 52
TA-98 tive control with metabout Tester Strain TA-98 tive control with metabout Tester Strain		2-Nitrofluorene Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound	Dose per plate (ug) 0.5 1//5/2013 Dose per plate (ug)	230.33 34.67 3167 Percent S9: Mean Plate Count 248.33 48.00 44.67 Percent S9: Mean Plate Count	27.57 9.07 153 5% Standard Deviation 19.14 12.00 6.35 10% Standard Deviation	Ratio Treated / Solvent 5.6 11 Ratio Treated / Solvent	228 43 30 Individu 264 41	204 36 33 ual Plate 227 48 41	Coun 25 60 52
TA-98 tive control with metabolic Tester Strain TA-98	59 (-/+) +(5%) +(5%) +(5%) +(5%) +(5%) +(5%)	2-Nitrofluorene Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine	3 11/5/2013 Dose per plate (ug) 0.5	230.33 34.67 3167 Percent S9: Mean Plate Count 248.33 48.00 44.67 Percent S9: Mean Plate Count 136.33	27.57 9.07 153 5% Standard Deviation 19.4 12.00 6.35 10% Standard Deviation 11.24	Ratio Treated / Solvent 5.6 11 Ratio Treated / Solvent 2.8	228 43 30 Individe 264 36 41 Individe 139	204 36 33 33 ual Plate 227 48 41	25 32 Count 144
TA-98 tive control with metabout Tester Strain TA-98 tive control with metabout Tester Strain	59 (-/+) +(5%) +(5%) +(5%) +(5%) +(5%) +(5%) +(10%) +(10%)	2-Nitrofluorene Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine Untreated Untreated Untreated Untreated Untreated Untreated Untreated	Dose per plate (ug) 0.5 1//5/2013 Dose per plate (ug)	230.33 34.67 3167 Percent S9: Mean Plate Count 248.33 48.00 44.67 Percent S9: Mean Plate Count 136.33 50.00	27.57 9.07 153 5% Standard Deviation 19.14 12.00 6.35 10% Standard Deviation 11.24 2.00	Ratio Treated / Solvent 5.6 11 Ratio Treated / Solvent	228 43 30 Individe 264 36 41 Individe 39 48	204 36 33 33 ual Plate 227 48 41 41 ual Plate 124 52	Count 25 60 52 Count 14 50
TA-98 tive control with metabout Tester Strain TA-98 tive control with metabout Tester Strain	59 (-/+) +(5%) +(5%) +(5%) +(5%) +(5%) +(5%)	2-Nitrofluorene Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine	Dose per plate (ug) 0.5 1//5/2013 Dose per plate (ug)	230.33 34.67 3167 Percent S9: Mean Plate Count 248.33 48.00 44.67 Percent S9: Mean Plate Count 136.33	27.57 9.07 153 5% Standard Deviation 19.4 12.00 6.35 10% Standard Deviation 11.24	Ratio Treated / Solvent 5.6 11 Ratio Treated / Solvent 2.8	228 43 30 Individe 264 36 41 Individe 139	204 36 33 33 ual Plate 227 48 41	25 60 52

Table 7: Individual and mean plate counts for Salmonella TA-100 exposed to Valero 25% Aromatic JP8 (POSF 8457)

t compound without me	labolic activation:	1	10/18/2013	<u> </u>	1	l navi-			
				M		Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent		ual Plate	
TA-100	-	Valero	5.000	115.67	8.74	0.9	123	106	118
	-	Valero	2.500	96.33	8.74	0.8	94	106	89
	-	Valero	1.250	108.67	5.69	0.9	107	104	115
	-	Valero	0.625	117.00	8.72	0.9	123	107	12
	-	Valero	0.313	121.67	9.29	1.0	111	128	120
	-	Valero	0.156	115.00	1.00	0.9	115	114	116
t compound with metabo	olic activation:		10/18/2013	Percent S9:	5%				
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	Count
TA-100	+(5%)	Valero	5.000	101.00	15.52	0.8	100	86	117
	+(5%)	Valero	2.500	102.00	2.00	0.9	102	104	10
	+(5%)	Valero	1.250	116.33	11.68	1.0	106	129	114
	+(5%)	Valero	0.625	129.33	0.58	1.1	129	130	129
	+(5%)	Valero	0.313	120.33	13.28	1.0	128	128	10:
	+(5%)	Valero	0.156	115.33	7.64	1.0	107	122	117
	T (3%)	valeiu	0.00	10.33	1.04	1.0	IU/	IZZ	- 10
t compound with most of	lio potivotio a		40/40/0040	Bornert Co	40.0/				
t compound with metabo	one activation:	1	10/18/2013	Percent S9:	10 %	Ratio			
				l					
		1		Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent		ual Plate	
TA-100	+(10%)	Valero	5.000	108.33	10.41	0.9	105	120	100
	+(10%)	Valero	2.500	119.67	7.37	0.9	114	117	128
	+(10%)	Valero	1.250	114.33	5.51	0.9	120	109	114
	+(10%)	Valero	0.625	120.00	8.54	0.9	111	128	12
	+(10%)	Valero	0.313	141.33	7.37	1.1	144	133	147
	+(10%)	Valero	0.156	131.00	8.54	1.0	130	140	123
itive control without me	tabolic activation		11/5/2013	1					
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individu	ual Plate	Count
TA-100	-	Sodium Azide	3	2236.00	86.53	18.0	2164	2212	233
	_	Untreated		121.67	3.06	1.0	121	119	125
	_	Solvent		124.00	13.53		123	111	138
		CONTON		12-1.00	10.00		20	- '''	100
itive control with metab	alic activation:		10/19/2013	Percent S9:	5%				
THE CONTROL WITH HICKAD	Jilo activation.		10/ 10/ 20 10	i Greent 33.		Ratio			
	1			Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Indivi-	ual Plate	C 0
TA-100	+(5%)	2-Anthramine	0.5	357.00	38.97	3.0	392	364	31
	+(5%)	Untreated		144.33	7.51	1.2	153	140	140
	+(5%)	Solvent		119.67	3.06		119	123	117
	olic activation:		10/18/2013	Percent S9:	10 %	_			
itive control with metab						Ratio			
itive control with metab		1		Mean Plate	Standard	Treated /			
itive control with metab				Count	Deviation	Solvent	Individu	ual Plate	Count
itive control with metab	S9 (-/+)	Compound	Dose per plate (ug)	Oount					
	S9 (-/+) +(10%)	Compound 2-Anthramine	Dose per plate (ug) 0.5	263.50	13.44	2.1	254	273	N/
Tester Strain					13.44 4.36	2.1 1.0	254 129	273 130	
Tester Strain	+(10%) +(10%)	2-Anthramine		263.50					137 124
Tester Strain	+(10%)	2-Anthramine Untreated		263.50 132.00	4.36		129	130	137

Table 8: Individual and mean plate counts for Salmonella TA-1535 exposed to Valero 25% Aromatic JP8 (POSF 8457)

t compound without me	tabolic activation:	1	12/10/2013			Dar!			
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Coun
TA-1535	-	Valero	5.000	7.67	4.04	0.8	12	7	4
	-	Valero	2.500	10.33	2.31	1.0	13	9	9
	-	Valero	1.250	9.67	1.15	1.0	9	9	11
	-	Valero	0.625	10.67	1.53	1.1	9	11	12
	-	Valero	0.313	10.33	0.58	1.0	10	11	10
	-	Valero	0.156	9.67	0.58	1.0	10	9	10
t compound with metabo	olic activation:		10/22/2013	Percent S9:	5%				
						Ratio	l		
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	Count
TA-1535	+(5%)	Valero	5.000	11.00	2.65	12	10	9	14
1 A - D33	+(5%)	Valero	2.500	7.67	2.83	0.9	9	9	5
	+(5%)	Valero	1.250	13.67	1.15	1.5	15	13	13
	+(5%)	Valero	0.625	13.00	2.00	1.4	13	15	11
	+(5%)	Valero	0.313	12.00	2.65	1.3	9	13	14
	+(5%)	Valero	0.156	14.33	0.58	1.6	14	15	14
t compound with metabo	olic activation:		12/10/2013	Percent S9:	10%				
						Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Count
TA-1535	+(10%)	Valero	5.000	9.33	2.08	1.0	11	7	10
	+(10%)	Valero	2.500	10.67	0.58	12	11	11	10
	+(10%)	Valero	1.250	12.00	4.36	1.3	14	15	7
	+(10%)	Valero	0.625	8.00	1.73	0.9	7	10	7
	+(10%)	Valero	0.313	13.00	1.00	1.4	12	14	13
	+(10%)	Valero	0.156	10.00	3.46	1.1	12	12	6
	T (10 /0)	Valeit	0.50	10.00	3.40	L.1	L L	IZ.	- 0
ition and attack to the contract	tabalia aatiwatiaa		12/10/2013						
itive control without me	tabolic activation	I	12/10/2013	1		Datia.	ı		
				 .		Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent		ual Plate	
TA-1535	-	Sodium Azide	3	617.33	94.16	61.7	686	510	650
					4.16	0.9	6	14	8
	-	Untreated		9.33		0.0			7
	-	Solvent		9.33	2.65	0.0	11	12	
	-			10.00	2.65	0.0	11	12	
itive control with metabo	-		10/22/2013		2.65		11	12	/
itive control with metab	-		10/22/2013	10.00	2.65	Ratio	11	12	7
itive control with metab	-		10/22/2013	10.00	2.65		11	12	
itive control with metabo	-		10/22/2013 Dose per plate (ug)	10.00 Percent S9:	2.65 5%	Ratio		12 ual Plate	
	olic activation:	Solvent		10.00 Percent S9: Mean Plate	2.65 5% Standard	Ratio Treated /			Count
Tester Strain	S9 (-/+) +(5%)	Solvent	Dose per plate (ug)	10.00 Percent S9: Mean Plate Count	2.65 5% Standard Deviation	Ratio Treated / Solvent	Individ	ual Plate	Count 34
Tester Strain	S9 (-/+) +(5%)	Compound 2-Anthramine	Dose per plate (ug)	Mean Plate Count 35.67	2.65 5% Standard Deviation 153	Ratio Treated / Solvent	Individ	ual Plate 36 15	Count 34
Tester Strain	S9 (-/+) +(5%)	Compound 2-Anthramine Untreated	Dose per plate (ug)	Mean Plate Count 35.67 13.67	2.65 5% Standard Deviation 153 2.31	Ratio Treated / Solvent	Individ: 37 15	ual Plate	Count 34
Tester Strain TA-1535	- S9 (-/+) +(5%) +(5%)	Compound 2-Anthramine Untreated	Dose per plate (ug)	10.00 Percent \$9: Mean Plate Count 35.67 13.67 9.00	2.65 5% Standard Deviation 153 2.31 2.65	Ratio Treated / Solvent	Individ: 37 15	ual Plate 36 15	Count 34
Tester Strain	- S9 (-/+) +(5%) +(5%) +(5%)	Compound 2-Anthramine Untreated	Dose per plate (ug)	Mean Plate Count 35.67 13.67	2.65 5% Standard Deviation 153 2.31 2.65	Ratio Treated / Solvent 4.0 1.5	Individ: 37 15	ual Plate 36 15	Count 34
Tester Strain TA-1535	- S9 (-/+) +(5%) +(5%) +(5%)	Compound 2-Anthramine Untreated	Dose per plate (ug)	10.00 Percent S9: Mean Plate Count 35.67 13.67 9.00 Percent S9:	2.65 5% Standard Deviation 153 2.31 2.65	Ratio Treated / Solvent 4.0 1.5	Individ: 37 15	ual Plate 36 15	Count 34
Tester Strain TA-1535 sitive control with metabo	- S9 (-/+) +(5%) +(5%) +(5%) Olic activation:	Compound 2-Anthramine Untreated Solvent	Dose per plate (ug) 0.5 12/10/2013	Mean Plate Count 35.67 9.00 Percent S9:	2.65 5% Standard Deviation 153 2.31 2.65 10% Standard	Ratio Treated / Solvent 4.0 15	Individ: 37 15 10	ual Plate 36 15 6	Count 34 11 11
Tester Strain TA-1535 itive control with metabo	- S9 (-/+) + (5%) + (5%) + (5%) olic activation: S9 (-/+)	Compound 2-Anthramine Untreated Solvent Compound	Dose per plate (ug) 0.5 12/10/2013 Dose per plate (ug)	Mean Plate Count 35.67 9.00 Percent S9: Mean Plate Count	2.65 Standard Deviation 153 2.31 2.65 10% Standard Deviation	Ratio Treated / Solvent 4.0 15	Individe 37 15 10	ual Plate 36 15 6	Count
Tester Strain TA-1535 sitive control with metabo	- S9 (-/+) + (5%) + (5%) + (5%) blic activation: S9 (-/+) + (10%)	Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine	Dose per plate (ug) 0.5 12/10/2013	Mean Plate Count 35.67 13.67 9.00 Percent S9: Mean Plate Count 33.00	2.65 5% Standard Deviation 153 2.31 2.65 10% Standard Deviation 2.65	Ratio Treated / Solvent 4.0 15 Ratio Treated / Solvent 3.7	Individ: 37 15 10 Individ: 36	ual Plate	Count 11 11 Count 32
Tester Strain TA-1535 itive control with metabo	- S9 (-/+) +(5%) +(5%) +(5%) (5%) -(5%) Dilic activation: S9 (-/+) +(10%) +(10%)	Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine Untreated	Dose per plate (ug) 0.5 12/10/2013 Dose per plate (ug)	10.00 Percent S9: Mean Plate Count 35.67 13.67 9.00 Percent S9: Mean Plate Count 33.00 15.00	2.65 5% Standard Deviation 153 2.31 2.65 10% Standard Deviation 2.65 100	Ratio Treated / Solvent 4.0 15	Individ: 37 15 10 Individ: 36 14	ual Plate 36 15 6 ual Plate 31 15	Count
Tester Strain TA-1535 itive control with metabo	- S9 (-/+) + (5%) + (5%) + (5%) blic activation: S9 (-/+) + (10%)	Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine	Dose per plate (ug) 0.5 12/10/2013 Dose per plate (ug)	Mean Plate Count 35.67 13.67 9.00 Percent S9: Mean Plate Count 33.00	2.65 5% Standard Deviation 153 2.31 2.65 10% Standard Deviation 2.65	Ratio Treated / Solvent 4.0 15 Ratio Treated / Solvent 3.7	Individ: 37 15 10 Individ: 36	ual Plate	Count

Table 9: Individual and mean plate counts for Salmonella TA-1537 exposed to Valero 25% Aromatic JP8 (POSF 8457)

t compound without me	tabolic activation:		10/28/2013						
						Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Count
TA-1537		Valero	5.000	15.00	3.61	1.0	14	19	12
177 201	_	Valero	2.500	13.33	4.04	0.9	17	14	9
	-	Valero	1.250	17.33	2.52	1.1	15	20	17
	-	Valero	0.625	12.67	5.13	0.8	7	14	17
	-					0.8	16	13	12
		Valero	0.313	13.67	2.08				
	-	Valero	0.156	13.67	5.51	0.9	14	8	19
t compound with metabo	olic activation:		10/28/2013	Percent S9:	5%				
						Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Count
TA-1537	+(5%)	Valero	5.000	17.33	5.51	0.9	11	20	21
	+(5%)	Valero	2.500	15.00	3.61	0.8	16	18	11
	+(5%)	Valero	1.250	23.00	6.24	1.2	18	21	30
	+(5%)	Valero	0.625	18.50	2.12	0.9	20	NA.	17
	+(5%)	Valero	0.313	16.33	3.79	0.8	12	18	19
	+(5%)	Valero	0.156	19.33	3.21	1.0	23	17	18
	+(370)	valeio	0.50	19.33	3.21	1.0	23	1/	Ю
to a series and a decided and a total	. Para de Caracteria		40/00/0040	D 1 00	40.07				
t compound with metabo	olic activation:	1 1	10/28/2013	Percent S9:	10%	B-41-	1		
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent		ual Plate	
TA-1537	+(10%)	Valero	5.000	22.50	2.12	1.1	24	NA	21
	+(10%)	Valero	2.500	18.67	7.23	0.9	15	27	14
	+(10%)	Valero	1.250	18.00	7.00	0.9	11	18	25
	+(10%)	Valero	0.625	23.00	7.21	1.2	15	29	25
	+(10%)	Valero	0.313	21.67	4.62	1.1	27	19	19
	+(10%)	Valero	0.156	25.00	1.41	1.3	24	NA	26
	. (10,10)	1,000,00							
sitive control without me	taholic activation		10/28/2013						
onive control without me	tabolio activation		10/20/2010	1		Ratio	I		
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	D - - - - -	Count	Deviation	Solvent	1	ual Plate	C4
	39 (-/+)		Dose per plate (ug)						_
TA-1537	-	9-Aminoacridine	100	1304.67	323.71	83.3	1640	1280	994
	-	Untreated		20.67	2.89	1.3	19	24	19
	-	Solvent		15.67	0.58		15	16	16
sitive control with metab	olic activation:		10/28/2013	Percent S9:	5%				
sitive control with metab	olic activation:		10/28/2013			Ratio			
sitive control with metab	olic activation:		10/28/2013	Percent S9:	5% Standard	Ratio Treated /			
sitive control with metab	olic activation:	Compound	10/28/2013 Dose per plate (ug)				Individ	ual Plate	Count
		Compound 2-Anthramine		M ean Plate	Standard	Treated /	Individi 56	ual Plate	
Tester Strain	\$9 (-/+) +(5%)		Dose per plate (ug)	Mean Plate Count	Standard Deviation 2.52	Treated / Solvent			53
Tester Strain	\$9 (-/+) +(5%) +(5%)	2-Anthramine Untreated	Dose per plate (ug)	M ean Plate Count 55.67 22.67	Standard Deviation 2.52 5.03	Treated / Solvent 2.8	56 18	58 28	53 22
Tester Strain	\$9 (-/+) +(5%)	2-Anthramine	Dose per plate (ug)	Mean Plate Count 55.67	Standard Deviation 2.52	Treated / Solvent 2.8	56	58	53 22
Tester Strain TA-1537	\$9 (-/+) +(5%) +(5%) +(5%)	2-Anthramine Untreated	Dose per plate (ug) 3	Mean Plate Count 55.67 22.67 20.00	Standard Deviation 2.52 5.03 100	Treated / Solvent 2.8	56 18	58 28	53 22
Tester Strain	\$9 (-/+) +(5%) +(5%) +(5%)	2-Anthramine Untreated	Dose per plate (ug) 3	M ean Plate Count 55.67 22.67	Standard Deviation 2.52 5.03 100	Treated / Solvent 2.8 1.1	56 18	58 28	53 22
Tester Strain TA-1537	\$9 (-/+) +(5%) +(5%) +(5%)	2-Anthramine Untreated	Dose per plate (ug) 3	Mean Plate Count 55.67 22.67 20.00 Percent S9:	Standard Deviation 2.52 5.03 100	Treated / Solvent 2.8 1.1 Ratio	56 18	58 28	53 22
Tester Strain TA-1537 sitive control with metabo	\$9 (-/+) +(5%) +(5%) +(5%) +(5%)	2-Anthramine Untreated Solvent	Dose per plate (ug) 3 10/28/2013	Mean Plate Count 55.67 22.67 20.00 Percent S9:	Standard Deviation 2.52 5.03 100 10% Standard	Treated / Solvent 2.8 1.1 Ratio Treated /	56 18 20	58 28 19	53 22 21
Tester Strain TA-1537 sitive control with metab	\$9 (-/+) +(5%) +(5%) +(5%) olic activation:	2-Anthramine Untreated Solvent	Dose per plate (ug) 3 10/28/2013 Dose per plate (ug)	Mean Plate Count 55.67 22.67 20.00 Percent S9: Mean Plate Count	Standard Deviation 2.52 5.03 100 10% Standard Deviation	Treated / Solvent 2.8 1.1 Ratio Treated / Solvent	56 18 20 Individ	58 28 19	53 22 21 Count
Tester Strain TA-1537 sitive control with metabo	\$9 (-/+) +(5%) +(5%) +(5%) +(5%) olic activation: \$9 (-/+) +(10%)	2-Anthramine Untreated Solvent Compound 2-Anthramine	Dose per plate (ug) 3 10/28/2013	Mean Plate Count 55.67 22.67 20.00 Percent S9: Mean Plate Count 42.33	Standard Deviation 2.52 5.03 100 10% Standard Deviation 2.31	Treated / Solvent 2.8 1.1 Ratio Treated / Solvent 2.2	56 18 20 Individe 45	58 28 19 ual Plate 41	53 22 21 Count
Tester Strain TA-1537 sitive control with metab	\$9 (-/+) +(5%) +(5%) +(5%) +(5%) olic activation: \$9 (-/+) +(10%)	2-Anthramine Untreated Solvent Compound 2-Anthramine Untreated	Dose per plate (ug) 3 10/28/2013 Dose per plate (ug)	Mean Plate Count 55.67 22.67 20.00 Percent \$9: Mean Plate Count 42.33 26.00	Standard Deviation 2.52 5.03 100 10% Standard Deviation 2.31 5.20	Treated / Solvent 2.8 1.1 Ratio Treated / Solvent	56 18 20 Individed 45 29	58 28 19 ual Plate 41 29	53 22 21 Count 41 20
Tester Strain TA-1537 sitive control with metab	\$9 (-/+) +(5%) +(5%) +(5%) +(5%) olic activation: \$9 (-/+) +(10%)	2-Anthramine Untreated Solvent Compound 2-Anthramine	Dose per plate (ug) 3 10/28/2013 Dose per plate (ug)	Mean Plate Count 55.67 22.67 20.00 Percent S9: Mean Plate Count 42.33	Standard Deviation 2.52 5.03 100 10% Standard Deviation 2.31	Treated / Solvent 2.8 1.1 Ratio Treated / Solvent 2.2	56 18 20 Individe 45	58 28 19 ual Plate 41	53 22 21 Count 41 20
Tester Strain TA-1537 sitive control with metab	\$9 (-/+) +(5%) +(5%) +(5%) +(5%) olic activation: \$9 (-/+) +(10%)	2-Anthramine Untreated Solvent Compound 2-Anthramine Untreated	Dose per plate (ug) 3 10/28/2013 Dose per plate (ug)	Mean Plate Count 55.67 22.67 20.00 Percent \$9: Mean Plate Count 42.33 26.00	Standard Deviation 2.52 5.03 100 10% Standard Deviation 2.31 5.20	Treated / Solvent 2.8 1.1 Ratio Treated / Solvent 2.2	56 18 20 Individed 45 29	58 28 19 ual Plate 41 29	53 22 21

Table 10: Individual and mean plate counts for *E. coli* WP2 exposed to Valero 25% Aromatic JP8 (POSF 8457)

t compound without met			12/3/2013			Ratio			
	I			M ean Plate	Standard	Treated /	1		
Tantan Ctualin	S9 (-/+)	T4 F	Dana man mlata (vd.)	Count	Deviation	Solvent	1	ual Plate	C
Tester Strain	39 (-/+)	Test Fuel	Dose per plate (uL)						
WP2	-	Valero	5.000	40.67	6.03	0.8	35	40	47
	-	Valero	2.500	47.67	8.50	1.0	39	56	48
	-	Valero	1.250	45.67	6.35	1.0	53	42	42
	-	Valero	0.625	46.33	6.11	1.0	53	41	45
	-	Valero	0.313	46.33	3.21	1.0	50	45	44
	-	Valero	0.156	44.00	2.00	0.9	42	44	46
t compound with metabo	lic activation:		12/3/2013	Percent S9:	5%				
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	Count
WP2	+(5%)	Valero	5.000	51.00		0.8	49	48	56
VVPZ					4.36				
	+(5%)	Valero	2.500	56.00	4.58	0.9	51	60	57
	+(5%)	Valero	1.250	51.67	5.69	0.8	47	58	50
	+(5%)	Valero	0.625	57.33	2.31	0.9	60	56	56
	+(5%)	Valero	0.313	55.67	1.15	0.9	57	55	55
	+(5%)	Valero	0.156	49.00	7.00	0.8	49	56	42
t compound with metabo	lio potivotio n		10/2/2016	Percent S9:	10.0/				
t compound with metabo	nic activation.	T I	12/3/2013	Fercent 39.	10 %	Ratio			
				M ean Plate	Standard	Treated /			
T 1 01 1 -	00//		D - (- (- 1)						
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent		ual Plate	
WP2	+(10%)	Valero	5.000	51.67	3.06	1.0	51	55	49
	+(10%)	Valero	2.500	50.67	1.15	1.0	50	50	52
	+(10%)	Valero	1.250	57.00	7.81	1.1	62	61	48
	+(10%)	Valero	0.625	61.33	6.66	1.2	69	57	58
	+(10%)	Valero	0.313	56.33	4.73	1.1	60	58	51
	+(10%)	Valero	0.156	51.33	2.08	1.0	53	52	49
sitive control without met	abolic activation	:	12/3/2013	3					
						Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individ	ual Plate	Count
WP2	-	4NQO	2.5	1181.33	12.86	24.6	1172	1176	1196
	-	Untreated		40.67	3.51	0.8	41	37	44
	-	Solvent		48.00	3.61	, , , , , , , , , , , , , , , , , , ,	51	49	44
sitive control with metabo	lic activation:		12/3/2013	Percent S9:	5%		1		
				I		Ratio	1		
		1.		M ean Plate	Standard	Treated /	1		
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent		ual Plate	_
WP2	+(5%)	2-Anthramine	20	652.00	78.08	10.1	648	576	732
	+(5%)	Untreated		64.67	14.19	1.0	52	80	62
	+(5%)	Solvent		64.33	9.07		56	63	74
10	Paradian Car		#010100#	D	40.07				
sitive control with metabo	olic activation:	T 1	12/3/2013	Percent S9:	10%	Bot!:	l		
						Ratio	1		
	1 -			M ean Plate	Standard	Treated /	1		
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent		ual Plate	
WP2	+(10%)	2-Anthramine	20	614.67	90.89	11.9	712	600	532
·	+(10%)	Untreated		61.00	1.73	1.2	62	59	62
	+(10%)	Solvent		51.67	13.58		66	50	39

Table 11: Individual and mean plate counts for *Salmonella* TA-98 exposed to KiOR Hydrotreated Kerosene/Bio-Kerosene (POSF 10327)

t compound without met	abolic activation:		11/5/201	3					
						Ratio	1		
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Cour
TA-98	- '	KiOR	2.500	28.33	8.62	0.9	30	36	1
	-	KiOR	1.250	35.67	5.69	1.1	34	31	4
	_	KiOR	0.625	26.67	7.64	0.8	35	20	2
	_	KiOR	0.313	27.67	7.37	0.9	25	36	2
	-	KiOR	0.156	24.00	3.00	0.8	21	24	2
	 	KiOR	0.078	30.33	2.31	1.0	29	33	2
	-	KIUR	0.078	30.33	2.31	I.U	29	33	
	Para Contract		445,1004	D 0.0	F0/				
t compound with metabo	olic activation:	T I	175/201	Percent S9:	5%	Ratio	l		
				M ean Plate	Standard	Treated /			_
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent		ual Plate	
TA-98	+(5%)	KiOR	2.500	38.33	1.53	0.9	37	38	4
	+(5%)	KiOR	1.250	42.00	7.00	0.9	49	42	3
· · · · · · · · · · · · · · · · · · ·	+(5%)	KiOR	0.625	43.33	5.51	1.0	47	46	3
	+(5%)	KiOR	0.313	37.33	5.13	0.8	43	33	3
	+(5%)	KiOR	0.156	38.33	1.53	0.9	40	37	3
	+(5%)	KiOR	0.078	32.67	8.14	0.7	27	29	4
	. (=,=)								
t compound with metabo	lic activation		11/5/201	Percent S9:	10%				
	doin attori.		113/201	- 0.00m 00.		Ratio			
				M ean Plate	Standard	Treated /			
T4 C4:-	S9 (-/+)	Test Fuel	Dana man mlata (ul.)	Count	Deviation	Solvent	1		C
Tester Strain			Dose per plate (uL)					ual Plate	
TA-98	+(10%)	KiOR	2.500	38.67	1.15	0.8	38	40	3
	+(10%)	KiOR	1.250	38.67	2.52	0.8	41	39	3
	+(10%)	KiOR	0.625	48.33	1.53	1.0	48	50	4
	+(10%)	KiOR	0.313	38.67	2.52	8.0	41	36	3
	+(10%)	KiOR	0.156	42.67	2.31	0.9	44	44	4
	+(10%)	KiOR	0.078	40.00	4.36	0.8	43	35	4
itive control without me	tabolic activation		11/5/201	3					
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individ	ual Plate	Cour
TA-98	-	2-Nitrofluorene	3	230.33	27.57	7.3	228	204	2
	-	Untreated	•	34.67	9.07	1.1	43	36	2
		Solvent		31.67	1.53		30	33	3
	-	COIVEIL		31.07	I.JJ		30	- 33	3
sitive control with metabo	olic activation:		11/E/201	Percent S9:	5%				
nave control with metabl	Jiio activation.	T 1	173/201	reicent 39:	J /0	Botio			
				M aan Blat	C4 = 1 = - 1	Ratio	1		
T 1 01 1-	00//	I	Baranan data ()	Mean Plate	Standard	Treated /			•
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent		ual Plate	
TA-98	+(5%)	2-Anthramine	0.5	248.33	19.14	5.6	264	227	2
1A-90	+(5%)	Untreated		48.00	12.00	1.1	36	48	6
14-90		10.1		44.67	6.35		41	41	5
17-90	+(5%)	Solvent							
	+(5%)	Solvent							
itive control with metabo	+(5%)	Solvent	11/5/201	Percent S9:	10%				
	+(5%)	Solvent	1/5/201	Percent S9:	10%	Ratio			
	+(5%)	Solvent	11/5/201	M ean Plate	10% Standard	Ratio Treated /			
	+(5%)	Compound	11/5/201				Individ	ual Plate	Cour
itive control with metabo	+(5%) blic activation: \$9 (-/+)	Compound		M ean Plate Count	Standard	Treated /	Individ	ual Plate	
citive control with metabo	+(5%) blic activation: \$9 (-/+) +(10%)	Compound 2-Anthramine	Dose per plate (ug)	Mean Plate Count 136.33	Standard Deviation 11.24	Treated / Solvent 2.8	139	124	14
citive control with metabo	+(5%) blic activation: \$9 (-/+) +(10%) +(10%)	Compound 2-Anthramine Untreated	Dose per plate (ug)	Mean Plate Count 136.33 50.00	Standard Deviation 11.24 2.00	Treated / Solvent	139 48	124 52	14
citive control with metabo	+(5%) blic activation: \$9 (-/+) +(10%)	Compound 2-Anthramine	Dose per plate (ug)	Mean Plate Count 136.33	Standard Deviation 11.24	Treated / Solvent 2.8	139	124	14

Table 12: Individual and mean plate counts for *Salmonella* TA-100 exposed to KiOR Hydrotreated Kerosene/Bio-Kerosene (POSF 10327)

t compound without met	abolic activation:		11/19/201	3					
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ıal Plate	Coun
TA-100	<u> </u>	KiOR	2.500	131.67	7.51	0.9	124	132	13
	-	KiOR	1.250	135.00	3.61	1.0	139	134	13
	_	KiOR	0.625	135.33	6.81	1.0	130	143	13
	<u> </u>	KiOR	0.313	131.00	17.35	0.9	116	127	15
	 	KiOR	0.156	154.33	9.45	1.1	151	165	14
	<u> </u>	KiOR	0.078	167.33	22.23	1.2	155	193	15
	-	KIUR	0.078	107.33	22.23	1.2	ca	193	G
	lia antivetian.		44/40/2004	Damant CO.	E0/				
t compound with metabo	lic activation:		17/19/201	Percent S9:	5% 	Ratio	l		
				M ean Plate	Standard	Treated /			
	22 / / >								_
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent		ıal Plate	
TA-100	+(5%)	KiOR	2.500	116.00	2.83	0.9	118	114	N.
	+(5%)	KiOR	1.250	101.00	6.08	0.8	97	98	10
	+(5%)	KiOR	0.625	118.67	13.05	0.9	129	123	10
	+(5%)	KiOR	0.313	122.00	16.82	1.0	141	116	10
	+(5%)	KiOR	0.156	129.33	10.21	1.0	122	125	14
	+(5%)	KiOR	0.078	126.33	10.07	1.0	137	125	11
	1 '								
t compound with metabo	lic activation:		11/19/201	Percent S9:	10%				
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ıal Plate	Coun
TA-100	+(10%)	KiOR	2.500	108.33	10.79	0.9	116	96	11
177 100	+(10%)	KiOR	1.250	124.67	15.01	1.0	110	124	14
	+(10%)	KiOR	0.625	129.00	8.19	1.1	122	127	13
									_
	+(10%)	KiOR	0.313	131.33	3.21	1.1	135	129	13
	+(10%)	KiOR	0.156	142.00	7.00	1.2	145	134	14
	+(10%)	KiOR	0.078	130.50	0.71	1.1	131	130	N/
sitive control without met	ah a lia a atiwatia a		11/19/201)					
sitive control without met	abolic activation	I	IV 19/20 k	<u> </u>	ı	Ratio	ı		
				Mean Plate	Standard	Treated /			_
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent		ıal Plate	_
TA-100	-	Sodium Azide	3	2175.33	126.21	15.7	2138	2316	20
	-	Untreated		139.67	2.31	1.0	141	137	14
	-	Solvent		138.67	9.61		137	149	13
sitive control with metabo	lic activation:		11/19/201	Percent S9:	5%				
						Ratio			
				Mean Plate	Standard	Treated /	1		
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individ	ıal Plate	Coun
TA-100	+(5%)	2-Anthramine	0.5	382.67	38.81	3.0	347	424	37
	+(5%)	Untreated		135.67	11.59	1.1	149	128	13
	+(5%)	Solvent		127.67	3.51		124	128	13
	. (0,0)	2217011			0.0.				
	lic activation:		11/19/201	Percent S9:	10%				
sitive control with metabo						Ratio			
sitive control with metabo		1		Mean Plate	Standard	Treated /	1		
sitive control with metabo									Cour
	SQ (-/±)	Compound	Dose per plate (ug)	Count	Deviation				
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent		al Plate	
	+(10%)	2-Anthramine	Dose per plate (ug) 0.5	297.00	3.46	2.5	295	295	30
Tester Strain	+(10%) +(10%)	2-Anthramine Untreated		297.00 132.67	3.46 2.31		295 134	295 130	30 13
Tester Strain	+(10%)	2-Anthramine		297.00	3.46	2.5	295	295	30 13 12

Table 13: Individual and mean plate counts for *Salmonella* TA-1535 exposed to KiOR Hydrotreated Kerosene/Bio-Kerosene (POSF 10327)

t dompound without mot	abolic activation:		11/22/2013	3					
						Ratio			
	1			M ean Plate	Standard	Treated /	1		
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Coun
TA-1535		KiOR	2.500	8.00	4.58	0.8	4	13	
1A-033	-	KiOR	1.250	9.00	2.00	0.9	7	11	9
	-	KiOR	0.625	9.00	2.65	0.9	11	10	6
	-	KiOR	0.313	9.67	1.53	0.9	8	11	10
	-	KiOR	0.156	7.00	0.00	0.7	7	7	7
	-	KiOR	0.078	8.67	3.79	0.8	7	13	(
t compound with metabo	olic activation:		10/22/2013	Percent S9:	5%				
						Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Coun
TA-1535	+(5%)	KiOR	2.500	10.67	1.15	1.2	10	12	10
200	+(5%)	KiOR	1.250	9.00	4.24	1.0	12	6	N.
	+(5%)	KiOR	0.625	13.67	4.16	1.5	9	15	1
	+(5%)	KiOR	0.823		2.52	0.9	11	6	8
				8.33				17	_
	+(5%)	KiOR	0.156	11.00	5.57	1.2	6		10
	+(5%)	KiOR	0.078	10.67	1.53	1.2	11	9	12
t compound with metabo	olic activation:		12/10/2013	Percent S9:	10%				
						Ratio			
	1			Mean Plate	Standard	Treated /	1		
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Coun
TA-1535	+(10%)	KiOR	2.500	6.67	2.08	0.7	5	6	9
	+(10%)	KiOR	1.250	9.33	2.08	1.0	7	10	1
	+(10%)	KiOR	0.625	10.67	5.03	1.2	10	16	6
	+(10%)	KiOR	0.313	9.67	1.53	1.1	8	10	1
	+(10%)	KiOR	0.156	16.33	10.69	1.8	28	7	14
	+(10%)	KiOR	0.078	8.33	2.52	0.9	6	11	8
	+(1076)	NOR	0.076	0.33	2.32	0.9		- 11	
			44/00/00 #						
sitive control without me	tabolic activation:		11/22/201	3					
itive control without me	tabolic activation		11/22/201			Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	tabolic activation:	Compound	1/22/201 Dose per plate (ug)		Deviation	Treated / Solvent	Individ	ual Plate	Coun
				M ean Plate		Treated /	Individe 560	ual Plate 534	_
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	M ean Plate Count	Deviation	Treated / Solvent			59
Tester Strain	S9 (-/+)	Compound Sodium Azide	Dose per plate (ug)	Mean Plate Count 564.00	Deviation 32.19	Treated / Solvent 54.6	560	534	59 10
Tester Strain	S9 (-/+)	Compound Sodium Azide Untreated	Dose per plate (ug)	Mean Plate Count 564.00 14.33	32.19 5.13	Treated / Solvent 54.6	560 13	534 20	59 10
Tester Strain TA-1535	S9 (-/+) - - -	Compound Sodium Azide Untreated	Dose per plate (ug)	M ean Plate Count 564.00 14.33 10.33	32.19 5.13 4.04	Treated / Solvent 54.6	560 13	534 20	Coun 59 10
Tester Strain	S9 (-/+) - - -	Compound Sodium Azide Untreated	Dose per plate (ug)	Mean Plate Count 564.00 14.33	32.19 5.13 4.04	Treated / Solvent 54.6 1.4	560 13	534 20	59 10
Tester Strain TA-1535	S9 (-/+) - - -	Compound Sodium Azide Untreated	Dose per plate (ug)	Mean Plate Count 564.00 14.33 10.33	32.19 5.13 4.04	Treated / Solvent 54.6 1.4 Ratio	560 13	534 20	59 10
Tester Strain TA-1535 itive control with metabo	S9 (-/+)	Compound Sodium Azide Untreated Solvent	Dose per plate (ug) 3 10/22/201	M ean Plate Count 564.00 14.33 10.33 Percent S9:	Deviation 32.19 5.13 4.04 5% Standard	Treated / Solvent 54.6 1.4 Ratio Treated /	560 13 14	534 20 11	59
Tester Strain TA-1535 sitive control with metabo	\$9 (-/+)	Compound Sodium Azide Untreated Solvent Compound	Dose per plate (ug) 3 10/22/2010	Mean Plate Count 564.00 14.33 10.33 Percent S9: Mean Plate Count	Deviation	Treated / Solvent 54.6 1.4 Ratio Treated / Solvent	560 13 14 Individ	534 20 11	Coun
Tester Strain TA-1535 itive control with metabo	\$9 (-/+)	Compound Sodium Azide Untreated Solvent Compound 2-Anthramine	Dose per plate (ug) 3 10/22/201	Mean Plate Count 564.00 14.33 10.33 Percent S9: Mean Plate Count 35.67	Deviation	Treated / Solvent 54.6 14 Ratio Treated / Solvent 4.0	560 13 14 Individe 37	534 20 11 Jal Plate 36	59 11 6
Tester Strain TA-1535 sitive control with metabo	\$9 (-/+)	Compound Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated	Dose per plate (ug) 3 10/22/2010	Mean Plate Count 564.00 14.33 10.33 Percent S9: Mean Plate Count 35.67 13.67	Deviation	Treated / Solvent 54.6 1.4 Ratio Treated / Solvent	560 13 14 Individe 37	534 20 11 20 11 21 Plate 36 15	59 1 1 Coun 3
Tester Strain TA-1535 sitive control with metabo	\$9 (-/+)	Compound Sodium Azide Untreated Solvent Compound 2-Anthramine	Dose per plate (ug) 3 10/22/2010	Mean Plate Count 564.00 14.33 10.33 Percent S9: Mean Plate Count 35.67	Deviation	Treated / Solvent 54.6 14 Ratio Treated / Solvent 4.0	560 13 14 Individu 37	534 20 11 Jal Plate 36	59 1 1 Coun 3
Tester Strain TA-1535 intive control with metabolitive Strain TA-1535	\$9 (-/+)	Compound Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated	Dose per plate (ug) 3 10/22/201 Dose per plate (ug) 0.5	Mean Plate Count 564.00 14.33 10.33 Percent S9: Mean Plate Count 35.67 13.67 9.00	Deviation 32.19 5.13 4.04 5% Standard Deviation 153 2.31 2.65	Treated / Solvent 54.6 14 Ratio Treated / Solvent 4.0	560 13 14 Individe 37	534 20 11 20 11 21 Plate 36 15	59 10 6 Coun 3
Tester Strain TA-1535 sitive control with metabo	\$9 (-/+)	Compound Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated	Dose per plate (ug) 3 10/22/201 Dose per plate (ug) 0.5	Mean Plate Count 564.00 14.33 10.33 Percent S9: Mean Plate Count 35.67 13.67	Deviation 32.19 5.13 4.04 5% Standard Deviation 153 2.31 2.65	Treated / Solvent 54.6 14 Ratio Treated / Solvent 4.0	560 13 14 Individe 37	534 20 11 20 11 21 Plate 36 15	59 10 6 Coun 3
Tester Strain TA-1535 intive control with metabolitive Strain TA-1535	\$9 (-/+)	Compound Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated	Dose per plate (ug) 3 10/22/201 Dose per plate (ug) 0.5	Mean Plate Count 564.00 14.33 10.33 Percent S9: Mean Plate Count 35.67 13.67 9.00	Deviation 32.19 5.13 4.04 5% Standard Deviation 153 2.31 2.65	Treated / Solvent 54.6 14 Ratio Treated / Solvent 4.0	560 13 14 Individe 37	534 20 11 20 11 21 Plate 36 15	59 10 6 Coun 3
Tester Strain TA-1535 intive control with metabolitive Strain TA-1535	\$9 (-/+)	Compound Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated	Dose per plate (ug) 3 10/22/201 Dose per plate (ug) 0.5	Mean Plate Count 564.00 14.33 10.33 Percent S9: Mean Plate Count 35.67 13.67 9.00	Deviation 32.19 5.13 4.04 5% Standard Deviation 153 2.31 2.65	Treated / Solvent 54.6 14 Ratio Treated / Solvent 4.0 15	560 13 14 Individe 37	534 20 11 20 11 21 Plate 36 15	59 1 1 Coun 3
Tester Strain TA-1535 ittive control with metabolitic Tester Strain TA-1535	\$9 (-/+)	Compound Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated Solvent	Dose per plate (ug) 3 10/22/201 Dose per plate (ug) 0.5	Mean Plate Count 564.00 14.33 10.33 Percent S9: Mean Plate Count 35.67 13.67 9.00 Percent S9: Mean Plate	Deviation 32.19 5.13 4.04 5% Standard Deviation 153 2.31 2.65 10% Standard	Treated / Solvent 54.6 14 Ratio Treated / Solvent 4.0 15	560 13 14 Individu 37 15	534 20 11 20 21 21 21 21 21 21 21 21 21 21 21 21 21	559 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Tester Strain TA-1535 itive control with metabolitive control with metabolitics.	\$9 (-/+)	Compound Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound	Dose per plate (ug) 3 10/22/201 Dose per plate (ug) 0.5 12/10/201 Dose per plate (ug)	Mean Plate Count 564.00 14.33 10.33 Percent S9: Mean Plate Count 35.67 13.67 9.00 Percent S9: Mean Plate Count	Deviation 32.19 5.13 4.04	Treated / Solvent 54.6 14 Ratio Treated / Solvent 4.0 15 Ratio Treated / Solvent	560 13 14 Individu 37 15 10	534 20 11 20 11 20 21 31 45 6	Coun
Tester Strain TA-1535 ittive control with metabolitic Tester Strain TA-1535	\$9 (-/+)	Compound Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine	Dose per plate (ug) 3 10/22/201 Dose per plate (ug) 0.5	Mean Plate Count 564.00 14.33 10.33 Percent S9: Mean Plate Count 35.67 13.67 9.00 Percent S9: Mean Plate Count 33.00	Deviation 32.19 5.13 4.04 5% Standard Deviation 153 2.31 2.65 10% Standard Deviation 2.65	Treated / Solvent 54.6 14 Ratio Treated / Solvent 4.0 15 Ratio Treated / Solvent 3.7	560 13 14 Individi 37 15 10	36 534 20 11 36 5 6	Coun 3:
Tester Strain TA-1535 Tester Strain TA-1535 TA-1535	\$9 (-/+)	Compound Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine Untreated Untreated Compound Untreated	Dose per plate (ug) 3 10/22/201 Dose per plate (ug) 0.5 12/10/201 Dose per plate (ug)	Mean Plate Count 564.00 14.33 10.33 Percent S9: Mean Plate Count 35.67 13.67 9.00 Mean Plate Count 33.00 15.00	Deviation 32.19 5.13 4.04	Treated / Solvent 54.6 14 Ratio Treated / Solvent 4.0 15 Ratio Treated / Solvent	560 13 14 Individe 37 15 10	534 20 11 20 11 36 15 6	Coun 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Tester Strain TA-1535 Tester Strain TA-1535 TA-1535	\$9 (-/+)	Compound Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine	Dose per plate (ug) 3 10/22/201 Dose per plate (ug) 0.5 12/10/201 Dose per plate (ug)	Mean Plate Count 564.00 14.33 10.33 Percent S9: Mean Plate Count 35.67 13.67 9.00 Percent S9: Mean Plate Count 33.00	Deviation 32.19 5.13 4.04 5% Standard Deviation 153 2.31 2.65 10% Standard Deviation 2.65	Treated / Solvent 54.6 14 Ratio Treated / Solvent 4.0 15 Ratio Treated / Solvent 3.7	560 13 14 Individi 37 15 10	36 534 20 11 36 5 6	59 10 6 Coun 3,

Table 14: Individual and mean plate counts for *Salmonella* TA-1537 exposed to KiOR Hydrotreated Kerosene/Bio-Kerosene (POSF 10327)

	abolic activation:		10/28/2013	3					
						Ratio			
	ĺ			M ean Plate	Standard	Treated /	1		
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Coun
TA-1537		KiOR	2.500	10.33	2.08	0.7	12	11	8
171 007	_	KiOR	1.250	10.00	5.29	0.6	4	12	1
		KiOR	0.625	13.67	5.03	0.9	9	13	19
	-	KiOR	0.313	17.33	2.89	1.1	14	19	19
	+ :	KiOR	0.156	14.67		0.9	20	9	15
	-				5.51				_
	-	KiOR	0.078	17.00	1.73	1.1	18	18	15
					_				
t compound with metabo	lic activation:	1	10/28/2013	Percent S9:	5%	1			
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Coun
TA-1537	+(5%)	KiOR	2.500	14.33	1.53	0.7	16	14	1
	+(5%)	KiOR	1.250	21.00	4.58	1.1	22	16	2
	+(5%)	KiOR	0.625	14.33	3.21	0.7	13	18	12
	+(5%)	KiOR	0.313	13.00	7.55	0.7	12	6	2
	+(5%)	KiOR	0.156	18.67	3.79	0.9	17	23	1
	+(5%)	KiOR	0.078	20.00	4.24	1.0	17	NA	2
	+(370)	NON	0.070	20.00	7.47	1.0	"	11/7	
t compound with motals	lie activation:		40/20/20#	Dorocht Co.	10.9/				
t compound with metabo	nic activation:		10/28/20%	Percent S9:	10 70	Ratio			
							1		
			_	Mean Plate	Standard	Treated /	l		_
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent		ual Plate	
TA-1537	+(10%)	KiOR	2.500	22.33	2.52	1.1	22	20	2
	+(10%)	KiOR	1.250	19.33	0.58	1.0	19	20	19
	+(10%)	KiOR	0.625	19.67	5.51	1.0	17	26	16
	+(10%)	KiOR	0.313	20.67	1.15	1.1	20	20	22
	+(10%)	KiOR	0.156	25.00	3.46	1.3	21	27	2
	+(10%)	KiOR	0.078	24.33	7.64	1.2	31	26	16
	`								
sitive control without met	abolic activation		10/28/2019	3					
sitive control without met	abolic activation	: 	10/28/2013	<u> </u>		Ratio			
sitive control without met	abolic activation:		10/28/201		Standard	Ratio			
				M ean Plate	Standard	Treated /	Individu	ual Blata	Caun
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	M ean Plate Count	Deviation	Treated / Solvent		ual Plate	
	S9 (-/+) -	Compound 9-Aminoacridine		Mean Plate Count 1304.67	Deviation 323.71	Treated / Solvent 83.3	1640	1280	99
Tester Strain	S9 (-/+)	Compound 9-Amino acridine Untreated	Dose per plate (ug)	Mean Plate Count 1304.67 20.67	323.71 2.89	Treated / Solvent	1640 19	1280 24	99
Tester Strain	S9 (-/+) -	Compound 9-Aminoacridine	Dose per plate (ug)	Mean Plate Count 1304.67	Deviation 323.71	Treated / Solvent 83.3	1640	1280	99
Tester Strain TA-1537	\$9 (-/+) - - -	Compound 9-Amino acridine Untreated	Dose per plate (ug)	M ean Plate Count 1304.67 20.67 15.67	323.71 2.89 0.58	Treated / Solvent 83.3	1640 19	1280 24	_
Tester Strain	\$9 (-/+) - - -	Compound 9-Amino acridine Untreated	Dose per plate (ug)	Mean Plate Count 1304.67 20.67	323.71 2.89 0.58	Treated / Solvent 83.3 1.3	1640 19	1280 24	99
Tester Strain TA-1537	\$9 (-/+) - - -	Compound 9-Amino acridine Untreated	Dose per plate (ug)	Mean Plate Count 1304.67 20.67 15.67	Deviation 323.71 2.89 0.58	Treated / Solvent 83.3 1.3	1640 19	1280 24	99
Tester Strain TA-1537 sitive control with metabo	S9 (-/+)	Compound 9-Aminoacridine Untreated Solvent	Dose per plate (ug) 100 10/28/201	M ean Plate Count 1304.67 20.67 15.67 Percent S9: M ean Plate	Deviation 323.71 2.89 0.58 5% Standard	Treated / Solvent 83.3 1.3 Ratio Treated /	1640 19 15	1280 24 16	99
Tester Strain TA-1537 sitive control with metabo	S9 (-/+)	Compound 9-Amino acridine Untreated	Dose per plate (ug)	Mean Plate Count 1304.67 20.67 15.67	Deviation 323.71 2.89 0.58 5% Standard Deviation	Treated / Solvent 83.3 1.3	1640 19 15	1280 24	99
Tester Strain TA-1537 sitive control with metabo	S9 (-/+)	Compound 9-Aminoacridine Untreated Solvent	Dose per plate (ug) 100 10/28/201	M ean Plate Count 1304.67 20.67 15.67 Percent S9: M ean Plate	Deviation 323.71 2.89 0.58 5% Standard	Treated / Solvent 83.3 1.3 Ratio Treated /	1640 19 15	1280 24 16	99 11 16
Tester Strain TA-1537 sitive control with metabo	S9 (-/+)	Compound 9-Aminoacridine Untreated Solvent Compound	Dose per plate (ug) 100 10/28/2010 Dose per plate (ug)	Mean Plate Count 1304.67 20.67 15.67 Percent S9: Mean Plate Count	Deviation 323.71 2.89 0.58 5% Standard Deviation	Treated / Solvent 83.3 13 Ratio Treated / Solvent	1640 19 15	1280 24 16	99 16 16 Coun
Tester Strain TA-1537 sitive control with metabo	S9 (-/+)	Compound 9-Aminoacridine Untreated Solvent Compound 2-Anthramine Untreated	Dose per plate (ug) 100 10/28/2010 Dose per plate (ug)	Mean Plate Count 1304.67 20.67 15.67 Mean Plate Count 55.67 22.67	Deviation	Treated / Solvent 83.3 13 13 Ratio Treated / Solvent 2.8	1640 19 15 Individe 56	1280 24 16 ual Plate 58	99 16 16 Coun 53
Tester Strain TA-1537 sitive control with metabo	S9 (-/+)	Compound 9-Amino acridine Untreated Solvent Compound 2-Anthramine	Dose per plate (ug) 100 10/28/2010 Dose per plate (ug)	Mean Plate Count 1304.67 20.67 15.67 Percent S9: Mean Plate Count 55.67	Deviation 323.71 2.89 0.58 5% Standard Deviation 2.52 5.03	Treated / Solvent 83.3 13 13 Ratio Treated / Solvent 2.8	1640 19 15 Individe 56 18	1280 24 16 ual Plate 58 28	99 16 16 Coun 53
Tester Strain TA-1537 sitive control with metabo Tester Strain TA-1537	\$9 (-/+)	Compound 9-Aminoacridine Untreated Solvent Compound 2-Anthramine Untreated	Dose per plate (ug) 100 10/28/201 Dose per plate (ug) 3	Mean Plate Count 1304.67 20.67 15.67 3 Percent S9: Mean Plate Count 55.67 22.67 20.00	Deviation 323.71 2.89 0.58 5% Standard Deviation 2.52 5.03 100	Treated / Solvent 83.3 13 13 Ratio Treated / Solvent 2.8	1640 19 15 Individe 56 18	1280 24 16 ual Plate 58 28	99 16 16 Coun 53
Tester Strain TA-1537 sitive control with metabo	\$9 (-/+)	Compound 9-Aminoacridine Untreated Solvent Compound 2-Anthramine Untreated	Dose per plate (ug) 100 10/28/201 Dose per plate (ug) 3	Mean Plate Count 1304.67 20.67 15.67 Mean Plate Count 55.67 22.67	Deviation 323.71 2.89 0.58 5% Standard Deviation 2.52 5.03 100	Treated / Solvent 83.3 13 13 Ratio Treated / Solvent 2.8 1.1	1640 19 15 Individe 56 18	1280 24 16 ual Plate 58 28	99 16 16 Coun 53
Tester Strain TA-1537 sitive control with metabo Tester Strain TA-1537	\$9 (-/+)	Compound 9-Aminoacridine Untreated Solvent Compound 2-Anthramine Untreated	Dose per plate (ug) 100 10/28/201 Dose per plate (ug) 3	Mean Plate Count 1304.67 20.67 15.67 Mean Plate Count 55.67 22.67 20.00 Percent S9:	Deviation	Treated / Solvent 83.3 13 Ratio Treated / Solvent 2.8 11	1640 19 15 Individe 56 18	1280 24 16 ual Plate 58 28	99 16 16 Coun 53
Tester Strain TA-1537 Sitive control with metabor Tester Strain TA-1537	\$9 (-/+)	Compound 9-Aminoacridine Untreated Solvent Compound 2-Anthramine Untreated Solvent	Dose per plate (ug) 100 10/28/201 Dose per plate (ug) 3	Mean Plate Count 1304.67 20.67 15.67 Mean Plate Count 55.67 22.67 20.00 Percent S9: Mean Plate Mean Plate Mean Plate Mean Plate	Deviation	Treated / Solvent 83.3 13 13 Ratio Treated / Solvent 2.8 11 Ratio Treated / Treated / Treated / Treated / Treated / Treated / Treated / Treated / Solvent 2.8 11 Ratio Treated / Treated / Solvent 2.8 11 Ratio Treated /	1640 19 15 Individe 56 18 20	1280 24 16 ual Plate 58 28	999 11 11 11 11 11 11 11 11 11 11 11 11
Tester Strain TA-1537 Sitive control with metabor Tester Strain TA-1537 Sitive control with metabor Tester Strain	\$9 (-/+)	Compound 9-Aminoacridine Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound	Dose per plate (ug) 100 10/28/201 Dose per plate (ug) 3 10/28/201 Dose per plate (ug)	Mean Plate Count 1304.67 20.67 15.67 Mean Plate Count 55.67 22.67 20.00 Mean Plate Count Count Count Count Count Count Count	Deviation 323.71 2.89 0.58	Treated / Solvent 83.3 13 13 Ratio Treated / Solvent 2.8 11 Ratio Treated / Solvent Solvent Solvent Solvent Solvent Solvent Solvent Solvent	1640 19 15 Individu 56 18 20	1280 24 16 ual Plate 58 28 19	999 11 11 11 Count
Tester Strain TA-1537 Sitive control with metabor Tester Strain TA-1537	\$9 (-/+)	Compound 9-Aminoacridine Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine	Dose per plate (ug) 100 10/28/201 Dose per plate (ug) 3	Mean Plate Count 1304.67 20.67 15.67 Percent S9: Mean Plate Count 55.67 22.67 20.00 Percent S9: Mean Plate Count 42.33	Deviation 323.71 2.89 0.58	Treated / Solvent 83.3 13 13 Ratio Treated / Solvent 2.8 11 Ratio Treated / Solvent 2.8 2.8 1.1 Ratio Treated / Solvent 2.2 2.8	1640 19 15 Individi 56 18 20 Individi 45	1280 24 16 16 28 28 19	999 18 16 16 16 16 16 16 16 16 16 16 16 16 16
Tester Strain TA-1537 Sitive control with metabor Tester Strain TA-1537 Sitive control with metabor Tester Strain	\$9 (-/+)	Compound 9-Amino acridine Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine Untreated Untreated Compound Compound Compound Compound Compound Compound	Dose per plate (ug) 100 10/28/201 Dose per plate (ug) 3 10/28/201 Dose per plate (ug)	Mean Plate Count 1304.67 20.67 15.67 Mean Plate Count 55.67 22.67 20.00 Mean Plate Count 42.33 26.00	Deviation	Treated / Solvent 83.3 13 13 Ratio Treated / Solvent 2.8 11 Ratio Treated / Solvent Solvent Solvent Solvent Solvent Solvent Solvent Solvent	1640 19 15 Individe 56 18 20 Individe 45 29	1280 24 16 41 28 19 19	995 18 18 20 20 20 Coun 4
Tester Strain TA-1537 Sitive control with metabor Tester Strain TA-1537 Sitive control with metabor Tester Strain	\$9 (-/+)	Compound 9-Aminoacridine Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine	Dose per plate (ug) 100 10/28/201 Dose per plate (ug) 3 10/28/201 Dose per plate (ug)	Mean Plate Count 1304.67 20.67 15.67 Percent S9: Mean Plate Count 55.67 22.67 20.00 Percent S9: Mean Plate Count 42.33	Deviation 323.71 2.89 0.58	Treated / Solvent 83.3 13 13 Ratio Treated / Solvent 2.8 11 Ratio Treated / Solvent 2.8 2.8 1.1 Ratio Treated / Solvent 2.2 2.8	1640 19 15 Individi 56 18 20 Individi 45	1280 24 16 16 28 28 19	999 16 16 16 16 16 16 16 16 16 16 16 16 16

Table 15: Individual and mean plate counts for *E. coli* WP2 exposed to KiOR Hydrotreated Kerosene/Bio-Kerosene (POSF 10327)

compound without met	tabolic activation:		12/3/201	3					
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Cour
WP2	- '	KiOR	2.500	40.67	3.21	0.8	37	43	4
	_	KiOR	1.250	49.00	5.20	1.0	46	55	4
	_	KiOR	0.625	37.33	6.66	0.8	30	39	4
	_	KiOR	0.313	49.00	5.20	1.0	55	46	4
	+	KiOR	0.156	42.67	3.79	0.9	41	47	4
	-	KiOR	0.078	44.00	3.00	0.9	44	47	4
	-	KIUR	0.078	44.00	3.00	0.9	44	47	- 4
and the second s	. P C C		40/0/004	2 2 1 00	F0/				
compound with metabo	olic activation:		12/3/201	3 Percent S9:	5%				
				l		Ratio			
				M ean Plate	Standard	Treated /			_
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent		ual Plate	
WP2	+(5%)	KiOR	2.500	52.33	0.58	0.8	52	53	5
	+(5%)	KiOR	1.250	59.00	3.61	0.9	56	58	6
	+(5%)	KiOR	0.625	54.00	10.82	8.0	42	63	5
	+(5%)	KiOR	0.313	52.00	5.20	0.8	46	55	5
	+(5%)	KiOR	0.156	50.33	9.29	0.8	40	53	5
	+(5%)	KiOR	0.078	55.33	3.51	0.9	59	52	5
	12.7								<u> </u>
compound with metabo	olic activation		12/3/201	Percent S9:	10%				_
. compound mannetable	3 110 dott/ dt.10111		E 0/20	1		Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	C
WP2		KiOR							
WP2	+(10%)		2.500	54.00	3.00	1.0	51	57	5
	+(10%)	KiOR	1.250	52.33	4.62	1.0	55	55	4
	+(10%)	KiOR	0.625	51.67	6.51	1.0	52	45	5
	+(10%)	KiOR	0.313	52.67	5.51	1.0	50	59	4
	+(10%)	KiOR	0.156	48.33	3.21	0.9	47	52	4
	+(10%)	KiOR	0.078	48.67	2.89	0.9	52	47	4
itive control without met	tabolic activation		12/3/201	3					
						Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individ	ual Plate	Cour
WP2	- '	4NQO	2.5	1181.33	12.86	24.6	1172	1176	11
	-	Untreated		40.67	3.51	0.8	41	37	4
	_	Solvent		48.00	3.61	4.0	51	49	4
		CONTON		10.00	0.01		0.		
itive control with metabo	olic activation:		12/3/201	3 Percent S9:	5%				
3 dominor with motable	2J doi dilon.	1	E 3/ 20 F	1		Ratio			
				M ean Plate	Standard	Treated /			
Tantar Strain	60 (/:)	Compound	Desc per plate ()	Count	Deviation	Solvent	Indiv: 4	ual Plate	C ~
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)						
WP2	+(5%)	2-Anthramine	20	652.00	78.08	10.1	648	576	7:
	+(5%)	Untreated		64.67	14.19	1.0	52	80	6
	+(5%)	Solvent		64.33	9.07		56	63	7
itive control with metabo	olic activation:		12/3/201	Percent S9:	10%				
	1					Ratio	1		
	1			M ean Plate	Standard	Treated /	1		
	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individ	ual Plate	Cour
Tester Strain		2-Anthramine	20	614.67	90.89	11.9	712	600	5
Tester Strain WP2	+(10%)	2-Antinamine				1.2	00		
		Untreated		61.00	1.73	1.2	62	59	
	+(10%) +(10%)	Untreated				1.2		59	3
	+(10%)	•		61.00 51.67	1.73 13.58	1.2	66		_

Table 16: Individual and mean plate counts for Salmonella TA-98 exposed to ARA ReadiJet (POSF 10328)

Tester Strain	bolic activation:	ı ı	11/5/2013	<u> </u>	Ī	D-4:-			
TA-98 - ARA 5.000 29.67 0.58 0.9 30 29.67				M ean Plate	Standard	Treated /			
- ARA 2500 28.67 32.1 0.9 31 30 - ARA 1550 29.33 9.87 0.9 34 36 - ARA 0.625 33.00 6.66 10 39 26 - ARA 0.625 33.00 6.66 10 39 26 - ARA 0.66 34.67 7.02 11 34 28 - ARA 0.56 34.67 7.02 11 34 28 - ARA 1.250 36.67 5.86 0.8 38 27 - ARA 1.250 4.200 2.65 0.9 46 41 - ARA 0.56 4.200 2.65 0.9 46 41 - ARA 0.56 4.767 7.37 11 45 42 - ARA 0.56 4.767 7.37 11 45 42 - ARA 0.56 4.767 7.37 11 45 42 - ARA 0.56 4.767 7.37 11 45 42 - ARA 0.56 4.767 7.37 11 45 42 - ARA 0.56 4.767 7.37 15 11 45 42 - ARA 1.250 4.200 2.25 0.9 46 41 - ARA 1.250 4.200 2.25 0.9 46 41 - ARA 0.56 4.767 7.37 11 45 42 - ARA 0.56 4.767 7.37 11 45 42 - ARA 0.56 4.767 7.37 15 10 46 46 - ARA 0.56 4.767 7.37 11 45 42 - ARA 0.56 4.767 7.37 15 10 46 46 - ARA 0.56 4.767 7.37 15 10 46 46 - ARA 0.56 4.767 7.37 15 10 46 46 - ARA 0.56 4.767 7.37 15 10 46 46 - ARA 0.56 4.767 7.37 15 10 46 46 - ARA 0.56 4.767 7.37 15 10 46 46 - ARA 0.56 4.767 7.37 11 45 42 - ARA 0.56 4.767 7.37 15 10 46 46 - ARA 0.56 4.767 7.37 15 10 46 46 - ARA 0.56 4.767 7.37 15 10 46 46 - ARA 0.56 4.767 7.37 15 10 46 46 - ARA 0.56 4.767 7.37 15 10 40 40 40 40 40 40 40 40 40 40 40 40 40	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	Coun
- ARA	-	ARA	5.000	29.67	0.58	0.9	30	29	3
- ARA	-	ARA	2.500	28.67	3.21	0.9	31	30	2
Compound with metabolic activation:	-	ARA	1.250	29.33	9.87	0.9	34	36	18
ARA 0.56 34.67 7.02 11 34 28	-	ARA	0.625	33.00	6.56	1.0	39	26	3.
ARA 0.56 34.67 7.02 11 34 28	-	ARA	0.313	32.33	7.23	1.0	24	37	3
Tester Strain	-								4:
Tester Strain	1				-				
Tester Strain S9 (-f+) Test Fuel Dose per plate (uL) Count Count Count Solvent Individual Plate	ic activation:		11/5/2013	Percent S9:	5%				
Tester Strain						Ratio	Ì		
TA-98				Mean Plate	Standard	Treated /	Ì		
+(5%)	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	Coun
+(5%)	+(5%)	ARA	5.000	33.67	5.86	0.8	38	27	3
+(5%)		ARA	2.500	38.33	5.69	0.9	40	43	3:
+ (5%)									4
+(5%) ARA 0.313 47.00 5.29 11 51 41 +(5%) ARA 0.56 47.67 7.37 11 45 42									3
+ (5%) ARA 0.166 47.67 7.37 11 45 42									4
									5
Tester Strain	1 (370)	71175	0.00	77.07	7.57	6.1		-74	
Tester Strain S9 (-/+) Test Fuel Dose per plate (uL) Dose per plate (uL) Count Deviation Count Deviation Solvent Individual Plate TA-98	ic activation:		11/5/2013	Percent S9:	10%				
Tester Strain S9 (-/+) Test Fuel Dose per plate (uL) Dose per plate (uL) Count Deviation Count						Ratio			
Tester Strain S9 (-/+) Test Fuel Dose per plate (uL) Count Deviation Solvent Individual Plate				Mean Plate	Standard		Ì		
TA-98	S9 (-/+)	Test Fuel	Dose per plate (ul.)				Individu	ıal Plate	Coun
+(10%) ARA 2.500 42.00 12.49 0.9 56 32 +(10%) ARA 1250 4133 5.51 0.8 35 44 +(10%) ARA 0.625 40.00 6.08 0.8 44 43 +(10%) ARA 0.625 40.00 6.08 0.8 44 43 +(10%) ARA 0.625 40.00 10.82 0.9 53 32 +(10%) ARA 0.566 45.33 2.52 0.9 48 45									34
+ (10%)									38
+(10%)									4
+(10%) ARA 0.313 44.00 10.82 0.9 53 32 +(10%) ARA 0.156 45.33 2.52 0.9 48 45									33
+(10%) ARA 0.156 45.33 2.52 0.9 48 45									_
Tester Strain S9 (-/+) Compound Dose per plate (ug) Count Deviation Treated / Solvent Individual Plate Standard Count Deviation Solvent Individual Plate Standard Solvent Solv									43
Tester Strain	+(10%)	AKA	0.66	45.33	2.52	0.9	48	45	4,
Tester Strain	bolic activation		11/5/2013	3					
Tester Strain	T					Ratio			
Tester Strain				Mean Plate	Standard		Ì		
TA-98	S9 (-/+)	Compound	Dose per plate (ug)				Individu	ıal Plate	Coun
- Untreated 34.67 9.07 1.1 43 36 - Solvent 3167 1.53 30 33 sitive control with metabolic activation: ### Wean Plate Standard Treated / Solvent Solvent Individual Plate Plate Standard Solvent Solve	- 55 (7.1)								25
- Solvent 3167 153 30 33 sitive control with metabolic activation: Tester Strain S9 (-/+) Compound Dose per plate (ug) Count Deviation Solvent Individual Plate Standard Found Solvent + -		<u> </u>						2	
Tester Strain						1.1			3:
Tester Strain	 	Solveill		31.07	1.00		30	- 33	3,
Tester Strain	ic activation:		11/5/2015	Percent S9	5%				
Tester Strain			110/20 8	1		Ratio			
Tester Strain				Mean Plate	Standard		Ì		
TA-98	S9 (-/+)	Compound	Dose per plate (ug)				Individu	ıal Plate	Coun
+(5%) Untreated									25
+(5%) Solvent 44.67 6.35 41 41 **Sitive control with metabolic activation:** Tester Strain	. ,		0.5						60
Tester Strain S9 (-/+) Compound Dose per plate (ug) Count Deviation Treated / Solvent Individual Plate TA-98 +(10%) 2-Anthramine 0.5 136.33 1124 2.8 139 124 (10%) Untreated 50.00 2.00 10 48 52						6.1			52
Tester Strain	+(3%)	SUIVEIII		44.07	0.33		41	41	3,
Tester Strain	ic activation:		1/5/2019	Percent S9	10%				
Name		T 1	110/201	1		Ratio			
Tester Strain S9 (-/+) Compound Dose per plate (ug) Count Deviation Solvent Individual Plate TA-98 +(10%) 2-Anthramine 0.5 136.33 1124 2.8 139 124 +(10%) Untreated 50.00 2.00 10 48 52		1		Mean Plate	Standard		İ		
TA-98 +(10%) 2-Anthramine 0.5 136.33 1124 2.8 139 124 +(10%) Untreated 50.00 2.00 10 48 52	SQ (-/2)	Compound	Dose per plate (ug)				Individu	ıal Plato	Coun
+(10%) Untreated 50.00 2.00 10 48 52									14
			0.5						5
+(10%) Solvent 48.67 2.08 51 48						ı.U			4
	+(10%)	Solvent		48.b/	∠.08		57	48	4
		\$9 (-/+)	S9 (-/+) Test Fuel	S9 (-/+) Test Fuel	Sy (-/+) Test Fuel	S9 (-/+) Test Fuel	Sample	S9 (-/+) Test Fuel	S9 (-/+) Test Fuel

Table 17: Individual and mean plate counts for Salmonella TA-100 exposed to ARA ReadiJet (POSF 10328)

	abolic activation:		10/18/2013						
						Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	Count
TA-100		ARA	5.000	99.33	4.62	0.8	94	102	102
177 100	-	ARA	2.500	90.33	14.57	0.7	104	92	75
	-	ARA	1.250	100.67	3.06	0.8	98	104	100
	<u> </u>	ARA	0.625	119.67	8.14	1.0	114	116	129
	_								
	-	ARA	0.313	121.00	3.61	1.0	122	124	117
	-	ARA	0.156	111.67	16.92	0.9	126	93	116
t compound with metabo	lic activation:		10/18/2013	Percent S9:	5%				
						Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	Count
TA-100	+(5%)	ARA	5.000	101.33	9.07	0.8	111	93	100
	+(5%)	ARA	2.500	89.33	1.53	0.7	91	88	89
	+(5%)	ARA	1.250	127.67	15.04	1.1	120	118	145
	. ,					0.9	104		124
	+(5%)	ARA	0.625	112.33	10.41			109	
	+(5%)	ARA	0.313	108.67	1.53	0.9	109	110	107
	+(5%)	ARA	0.156	114.67	7.23	1.0	111	123	110
t compound with metabo	lic activation:		10/18/2013	Percent S9:	10 %				
						Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	Count
TA-100	+(10%)	ARA	5.000	100.67	8.50	0.8	92	101	109
TA-100	+(10%)	ARA	2.500	105.67	14.57	0.8	92	104	121
		ARA						119	
	+(10%)		1.250	120.67	9.61	1.0	131		112
	+(10%)	ARA	0.625	135.67	4.93	1.1	130	139	138
	+(10%)	ARA	0.313	137.33	8.96	1.1	142	143	127
	+(10%)	ARA	0.156	126.00	9.17	1.0	128	134	116
sitive control without met	and the Property of Contract Contract		10/18/2013						
onitio de intro i mitrio de infot	abolic activation:					Ratio			
	abolic activation								
	abolic activation:			Mean Plate	Standard	Treated /			
		Compound	Dose per plate (ug)		Standard Deviation		Individ	ual Plate	Count
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug) ੨	Count	Deviation	Solvent		ual Plate	
	S9 (-/+) -	Sodium Azide	Dose per plate (ug)	C o unt 2236.00	Deviation 86.53	Solvent 18.0	2164	2212	233
Tester Strain	S9 (-/+)	Sodium Azide Untreated		2236.00 121.67	86.53 3.06	Solvent	2164 121	2212 119	233 125
Tester Strain	S9 (-/+) -	Sodium Azide		C o unt 2236.00	Deviation 86.53	Solvent 18.0	2164	2212	233 125
Tester Strain TA-100	\$9 (-/+) - - -	Sodium Azide Untreated	3	2236.00 12167 124.00	86.53 3.06 13.53	Solvent 18.0	2164 121	2212 119	233: 125 138
Tester Strain TA-100	\$9 (-/+) - - -	Sodium Azide Untreated	3	2236.00 121.67	86.53 3.06 13.53	\$0 vent 18.0 1.0	2164 121	2212 119	233 125
Tester Strain	\$9 (-/+) - - -	Sodium Azide Untreated	3	Count 2236.00 12167 124.00	Deviation 86.53 3.06 13.53 5%	Solvent 18.0 1.0	2164 121	2212 119	233 125
Tester Strain TA-100 sitive control with metabo	S9 (-/+)	Sodium Azide Untreated Solvent	10/18/2013	Count 2236.00 12167 124.00 Percent S9:	Deviation 86.53 3.06 13.53 5% Standard	Solvent 18.0 1.0 Ratio Treated /	2164 121 123	2212 119 111	233 125 138
Tester Strain TA-100	\$9 (-/+) - - -	Sodium Azide Untreated	3	Count 2236.00 12167 124.00	Deviation 86.53 3.06 13.53 5%	Solvent 18.0 1.0	2164 121 123	2212 119	233 125 138
Tester Strain TA-100 sitive control with metabo	S9 (-/+)	Sodium Azide Untreated Solvent	10/18/2013	Count 2236.00 12167 124.00 Percent S9:	Deviation 86.53 3.06 13.53 5% Standard	Solvent 18.0 1.0 Ratio Treated /	2164 121 123	2212 119 111	233 125 138
Tester Strain TA-100 sitive control with metabo	\$9 (-/+)	Sodium Azide Untreated Solvent Compound	10/18/2013 Dose per plate (ug)	Count 2236.00 12167 124.00 Percent S9: Mean Plate Count	Deviation 86.53 3.06 13.53 5% Standard Deviation	Ratio Treated / Solvent	2164 121 123 Individu	2212 119 111	233 125 138 Count 315
Tester Strain TA-100 sitive control with metabo	S9 (-/+)	Sodium Azide Untreated Solvent Compound 2-Anthramine	10/18/2013 Dose per plate (ug)	Count 2236.00 12167 124.00 Percent S9: Mean Plate Count 357.00	Deviation	Ratio Treated / Solvent 3.0	2164 121 123 Individu 392	2212 119 111 111 111 111 111 111	233 125 138 Count 315
Tester Strain TA-100 sitive control with metabo	\$9 (-/+)	Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated	10/18/2013 Dose per plate (ug)	Count 2236.00 12167 124.00 Percent S9: Mean Plate Count 357.00 144.33	Deviation 86.53 3.06 13.53 5% Standard Deviation 38.97 7.51	Ratio Treated / Solvent 3.0	2164 121 123 Individu 392 153	2212 119 111 111 111 111 111 111 111 111	233 125 138 Count 315
Tester Strain TA-100 sitive control with metabo Tester Strain TA-100	\$9 (-/+)	Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated	0.5 0.5	Count 2236.00 12167 124.00 Percent S9: Mean Plate Count 357.00 144.33 119.67	Deviation 86.53 3.06 13.53 5% Standard Deviation 38.97 7.51 3.06	Ratio Treated / Solvent 3.0	2164 121 123 Individu 392 153	2212 119 111 111 111 111 111 111 111 111	233 125 138 Count 315
Tester Strain TA-100 sitive control with metabo	\$9 (-/+)	Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated	0.5 0.5	Count 2236.00 12167 124.00 Percent S9: Mean Plate Count 357.00 144.33	Deviation 86.53 3.06 13.53 5% Standard Deviation 38.97 7.51 3.06	Ratio Treated / Solvent 3.0 12	2164 121 123 Individu 392 153	2212 119 111 111 111 111 111 111 111 111	233: 125 138
Tester Strain TA-100 sitive control with metabo Tester Strain TA-100	\$9 (-/+)	Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated	0.5 0.5	Count 2236.00 12167 124.00 Percent S9: Mean Plate Count 357.00 144.33 119.67	Deviation 86.53 3.06 13.53 5% Standard Deviation 38.97 7.51 3.06	Ratio Treated / Solvent 3.0 12 Ratio	2164 121 123 Individu 392 153	2212 119 111 111 111 111 111 111 111 111	233 125 138 Count 315
Tester Strain TA-100 sitive control with metabo Tester Strain TA-100 sitive control with metabo	\$9 (-/+)	Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated Solvent	10/18/2013 Dose per plate (ug) 0.5	Count 2236.00 12167 124.00 Percent S9: Mean Plate Count 357.00 144.33 119.67 Percent S9: Mean Plate	Deviation 86.53 3.06 13.53 5% Standard Deviation 38.97 7.51 3.06 Standard Deviation 10% Standard	Ratio Treated / Solvent Ratio Treated / Solvent Ratio Treated / Treated /	2164 121 123 Individi 392 153 119	2212 119 111 111 111 111 111 111 111 111	233 125 138 Count 315 140
Tester Strain TA-100 sitive control with metabo Tester Strain TA-100 sitive control with metabo	\$9 (-/+)	Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound	10/18/2013 Dose per plate (ug) 0.5 10/18/2013 Dose per plate (ug)	Count	Deviation 86.53 3.06 13.53 Standard Deviation 38.97 7.51 3.06 Standard Deviation 30.06 Standard Deviation	Ratio Treated / Solvent Ratio Treated / Solvent Ratio Treated / Solvent Solvent	2164 121 123 Individu 392 153 119	2212 119 1111 221 Plate 364 140 123	233 125 138 Count 315 140 117
Tester Strain TA-100 sitive control with metabo Tester Strain TA-100 sitive control with metabo	\$9 (-/+)	Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine	10/18/2013 Dose per plate (ug) 0.5	Count 2236.00 12167 124.00 Percent S9: Mean Plate Count 357.00 144.33 119.67 Percent S9: Mean Plate Count 263.50	Deviation 86.53 3.06 13.53 5% Standard Deviation 38.97 7.51 3.06 Standard Deviation 13.44	Ratio Treated / Solvent 3.0 12 Ratio Treated / Solvent 2.1	2164 121 123 Individi 392 153 119 Individi 254	2212 119 111 111 221 23 24 140 123 23 24 273	233 125 138 Count 315 140 117
Tester Strain TA-100 sitive control with metabo Tester Strain TA-100 sitive control with metabo	\$9 (-/+)	Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine Untreated Untreated Compound Untreated	10/18/2013 Dose per plate (ug) 0.5 10/18/2013 Dose per plate (ug)	Count 2236.00 12167 124.00 Percent S9: Mean Plate Count 357.00 144.33 119.67 Percent S9: Mean Plate Count 263.50 132.00	Deviation 86.53 3.06 13.53 5% Standard Deviation 38.97 7.51 3.06 Standard Deviation 13.44 4.36	Ratio Treated / Solvent Ratio Treated / Solvent Ratio Treated / Solvent Solvent	2164 121 123 Individu 392 153 119 Individu 254 129	2212 119 1111 221 Plate 364 140 123 23 241 Plate 273 130	233 125 138 Count 315 140 117 Count NA 137
Tester Strain TA-100 Sitive control with metabo Tester Strain TA-100 Sitive control with metabo Tester Strain	\$9 (-/+)	Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine	10/18/2013 Dose per plate (ug) 0.5 10/18/2013 Dose per plate (ug)	Count 2236.00 12167 124.00 Percent S9: Mean Plate Count 357.00 144.33 119.67 Percent S9: Mean Plate Count 263.50	Deviation 86.53 3.06 13.53 5% Standard Deviation 38.97 7.51 3.06 Standard Deviation 13.44	Ratio Treated / Solvent 3.0 12 Ratio Treated / Solvent 2.1	2164 121 123 Individi 392 153 119 Individi 254	2212 119 111 111 221 23 24 140 123 23 24 273	233 125 138 Count 318 140 117

Table 18: Individual and mean plate counts for Salmonella TA-1535 exposed to ARA ReadiJet (POSF 10328)

compound without met	abolic activation:	1	11/22/2013	1	1	Darr-			
				l		Ratio			
	1			Mean Plate	Standard	Treated /	l		_
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent		ual Plate	
TA-1535	-	ARA	5.000	6.67	2.31	0.6	4	8	
	-	ARA	2.500	10.00	1.73	1.0	11	8	
	-	ARA	1.250	10.33	2.89	1.0	7	12	1
	-	ARA	0.625	7.33	1.53	0.7	7	6	
	-	ARA	0.313	11.33	1.53	1.1	13	11	1
	-	ARA	0.156	9.67	5.03	0.9	15	9	
ompound with metabo	lic activation:		10/22/2013	Percent S9:	5%				
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Coun
TA-1535	+(5%)	ARA	5.000	9.33	2.52	1.0	12	7	(
	+(5%)	ARA	2.500	13.67	4.51	1.5	14	18	9
	+(5%)	ARA	1.250	10.00	2.83	1.1	12	8	N.
	+(5%)	ARA	0.625	13.00	3.61	1.4	12	17	1
	+(5%)	ARA	0.313	17.00	5.29	1.9	11	21	1:
	+(5%)	ARA	0.156	16.00	2.65	1.8	13	18	1
	. (-,-/								<u> </u>
compound with metabo	lic activation:		12/10/2013	Percent S9:	10%				
				1		Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	Caun
TA-1535	+(10%)	ARA	5.000	9.67	2.89	1.1	8	13	8
1A-000	+(10%)	ARA	2.500	10.00	3.61	1.1	9	14	7
	+(10%)	ARA	1.250	6.67	3.06	0.7	6	10	-
		ARA	0.625	8.33	1.15	0.7	9	9	-
	+(10%)	ARA		13.33	2.31		12	16	1
	+(10%)		0.313			1.5			_
	+(10%)	ARA	0.156	9.33	2.52	1.0	12	7	9
	abatha na tha atha a		44/00/0040						
ive control without met	abolic activation:		11/22/2013	1	ı	Ratio	ı —		
		1		Mean Plate	Standard	Treated /			_
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent		ıal Plate	
TA-1535	-	Sodium Azide	3	564.00	32.19	54.6	560	534	59
	-	Untreated		14.33	5.13	1.4	13	20	10
	-	Solvent		10.33	4.04		14	11	- 6
ive control with metabo	olic activation:	1	10/22/2013	Percent S9:	5%		1		
						Ratio			
				M ean Plate	Standard	Treated /	l		_
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent		ial Plate	
TA-1535	+(5%)	2-Anthramine	0.5	35.67	1.53	4.0	37	36	3
	+(5%)	Untreated		13.67	2.31	1.5	15	15	1
	+(5%)	Solvent		9.00	2.65		10	6	1
	olic activation:		12/10/2013	Percent S9:	10 %				
ive control with metabo						Ratio			
ive control with metabo				Mean Plate	Standard	Treated /	1		
ive control with metabo									C 0 111
ive control with metabo	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individ	ual Plate	Coun
	S9 (-/+) +(10%)	Compound 2-Anthramine	Dose per plate (ug) 0.5	Count 33.00	Deviation 2.65	Solvent 3.7	36	Jal Plate 31	
Tester Strain									3
Tester Strain	+(10%)	2-Anthramine		33.00	2.65	3.7	36	31	3: 16

Table 19: Individual and mean plate counts for Salmonella TA-1537 exposed to ARA ReadiJet (POSF 10328)

compound without met	abolic activation:		11/15/2013						
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Count
TA-1537	-	ARA	5.000	16.33	3.21	0.9	14	15	20
	-	ARA	2.500	16.33	5.13	0.9	12	22	15
	-	ARA	1.250	14.67	1.15	0.8	14	16	14
	-	ARA	0.625	19.00	4.36	1,1	17	24	16
	-	ARA	0.313	16.67	4.93	1.0	11	20	19
	_	ARA	0.156	15.00	4.58	0.9	16	10	19
		7.11.07.1	0.00	10.00	1.00	0.0			
compound with metabo	lic activation:		11/15/2013	Percent S9:	5%				
oompound man motabo			11 10/20 1		0 ,0	Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	Count
TA-1537	+(5%)	ARA	5.000	16.33	2.52	0.9	16	19	14
1 A- D31	_ ` ′	ARA	2.500		4.73	1.1	22	24	15
	+(5%)			20.33					
	+(5%)	ARA	1.250	21.67	1.15	1.2	21	21	23
	+(5%)	ARA	0.625	22.33	2.52	1.2	22	20	25
	+(5%)	ARA	0.313	18.67	1.15	1.0	18	20	18
	+(5%)	ARA	0.156	19.67	6.51	1.1	26	13	20
compound with metabo	lic activation:	,	11/15/2013	Percent S9:	10%				
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent		ual Plate	
TA-1537	+(10%)	ARA	5.000	22.33	1.15	1.1	23	23	21
	+(10%)	ARA	2.500	20.00	1.00	1.0	21	19	20
	+(10%)	ARA	1.250	18.67	8.50	0.9	19	27	10
	+(10%)	ARA	0.625	24.00	1.00	1.2	25	24	23
	+(10%)	ARA	0.313	18.33	2.31	0.9	21	17	17
	+(10%)	ARA	0.156	20.00	2.00	1.0	18	22	20
	` '								
ive control without met	abolic activation		11/15/2013	·					
		1				Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individu	ual Plate	Count
TA-1537		9-Amino acridine	100	1184.00	98.00	68.3	1152	1106	129
1A-031	_	Untreated	NO NO	17.33	2.08	1.0	15	18	19
	+	Solvent		17.33	2.52	1.0	15	17	20
		SUIVEIIL		11.33	2.32		G	- 1/	20
								·	
in control with motals	olio activation:		44/45/2040	Borognt Co.	E 9/.				
tive control with metabo	olic activation:		11/15/2013	Percent S9:	5%	Bot!:	ı		
ive control with metabo	blic activation:		11/15/2013			Ratio			
				M ean Plate	Standard	Treated /			•
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Mean Plate Count	Standard Deviation	Treated / Solvent		ual Plate	
	S9 (-/+) +(5%)	2-Anthramine		Mean Plate Count 67.33	Standard Deviation 6.35	Treated / Solvent 3.7	60	71	71
Tester Strain	\$9 (-/+) +(5%) +(5%)	2-Anthramine Untreated	Dose per plate (ug)	Mean Plate Count 67.33 18.00	Standard Deviation 6.35 0.00	Treated / Solvent	60 18	71 18	71 18
Tester Strain	S9 (-/+) +(5%)	2-Anthramine	Dose per plate (ug)	Mean Plate Count 67.33	Standard Deviation 6.35	Treated / Solvent 3.7	60	71	71 18
Tester Strain TA-1537	\$9 (-/+) +(5%) +(5%) +(5%)	2-Anthramine Untreated	Dose per plate (ug) 3	M ean Plate Count 67.33 18.00 18.00	Standard Deviation 6.35 0.00 1.73	Treated / Solvent 3.7	60 18	71 18	71 18
Tester Strain TA-1537	\$9 (-/+) +(5%) +(5%) +(5%)	2-Anthramine Untreated	Dose per plate (ug) 3	Mean Plate Count 67.33 18.00	Standard Deviation 6.35 0.00 1.73	Treated / Solvent 3.7	60 18	71 18	71 18
Tester Strain TA-1537	\$9 (-/+) +(5%) +(5%) +(5%)	2-Anthramine Untreated	Dose per plate (ug) 3	M ean Plate Count 67.33 18.00 18.00	Standard Deviation 6.35 0.00 1.73	Treated / Solvent 3.7	60 18	71 18	71 18
Tester Strain	\$9 (-/+) +(5%) +(5%) +(5%)	2-Anthramine Untreated	Dose per plate (ug) 3	M ean Plate Count 67.33 18.00 18.00	Standard Deviation 6.35 0.00 1.73	Treated / Solvent 3.7 1.0	60 18	71 18	71 18
Tester Strain TA-1537	\$9 (-/+) +(5%) +(5%) +(5%) +(5%)	2-Anthramine Untreated	Dose per plate (ug) 3 11/15/2013	Mean Plate Count 67.33 18.00 18.00	Standard Deviation 6.35 0.00 173	Treated / Solvent 3.7 1.0 Ratio	60 18 17	71 18	71 18 17
Tester Strain TA-1537 ive control with metabo	\$9 (-/+) +(5%) +(5%) +(5%) -(5%) Disc activation:	2-Anthramine Untreated Solvent	Dose per plate (ug) 3	Mean Plate Count 67.33 18.00 18.00 Percent S9:	Standard Deviation 6.35 0.00 173	Treated / Solvent 3.7 10 Ratio Treated /	60 18 17	71 18 20	71 18 17
Tester Strain TA-1537 ive control with metabo	\$9 (-/+) +(5%) +(5%) +(5%) +(5%) blic activation: \$9 (-/+) +(10%)	2-Anthramine Untreated Solvent	Dose per plate (ug) 3 11/15/2013 Dose per plate (ug)	Mean Plate Count 67.33 18.00 18.00 Percent S9: Mean Plate Count	Standard Deviation 6.35 0.00 173 10% Standard Deviation	Treated / Solvent 3.7 10 Ratio Treated / Solvent	60 18 17	71 18 20 ual Plate	71 18 17 Count
Tester Strain TA-1537 ive control with metabo	\$9 (-/+) +(5%) +(5%) +(5%) +(5%) blic activation: \$9 (-/+) +(10%) +(10%)	2-Anthramine Untreated Solvent Compound 2-Anthramine Untreated	Dose per plate (ug) 3 11/15/2013 Dose per plate (ug)	Mean Plate Count 67.33 18.00 18.00 Recent \$9: Mean Plate Count 56.67 22.00	Standard Deviation 6.35 0.00 1.73 10% Standard Deviation 16.26 1.73	Treated / Solvent 3.7 10 Ratio Treated / Solvent 2.8	60 18 17 Individe 51 21	71 18 20 ual Plate 75 21	71 18 17 Count 44 24
Tester Strain TA-1537 ive control with metabo	\$9 (-/+) +(5%) +(5%) +(5%) +(5%) blic activation: \$9 (-/+) +(10%)	2-Anthramine Untreated Solvent Compound 2-Anthramine	Dose per plate (ug) 3 11/15/2013 Dose per plate (ug)	Mean Plate Count 67.33 18.00 18.00 Percent S9: Mean Plate Count 56.67	Standard Deviation 6.35 0.000 173 10% Standard Deviation 16.26	Treated / Solvent 3.7 10 Ratio Treated / Solvent 2.8	60 18 17 Individe 51	71 18 20 ual Plate 75	71 18 17 Count

Table 20: Individual and mean plate counts for E. coli WP2 exposed to ARA ReadiJet (POSF 10328)

it compound without mote	abolic activation:		12/3/2013						
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Mean Plate Count	Standard Deviation	Ratio Treated / Solvent	Individu	ual Plate	Count
WP2		ARA	5.000	43.00	7.21	0.9	35	45	49
VVI Z	_	ARA	2.500	39.00	3.61	0.8	38	43	36
	-	ARA	1.250	43.33	3.51	0.9	47	43	40
	-	ARA	0.625	45.33	5.51	0.9	45	40	5
	-	ARA	0.313	32.00	1.73	0.9	31	31	34
	-	ARA	0.313	45.67	6.66	1.0	53	44	40
		ARA	0.66	45.67	0.00	1.0	53	44	41
st compound with metabo	lic activation:		12/3/2013	Percent S9:	5%				
				M ean Plate	Standard	Ratio Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	C
WP2		+				0.9			48
VVP2	+(5%)	ARA	5.000	58.00	14.00		52	74	
	+(5%)	ARA	2.500	51.33	2.31	0.8	50	50	5-
	+(5%)	ARA	1.250	56.33	11.72	0.9	61	65	4:
	+(5%)	ARA	0.625	44.00	9.17	0.7	52	46	3
	+(5%)	ARA	0.313	50.00	6.56	0.8	57	44	4
	+(5%)	ARA	0.156	53.00	4.58	0.8	54	48	5
st compound with metabo	lic activation:		12/3/2013	Percent S9:	10 %	D-41-	l		
					04 11	Ratio			
				Mean Plate	Standard	Treated /			_
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent		ual Plate	
WP2	+(10%)	ARA	5.000	52.67	3.06	1.0	50	52	56
	+(10%)	ARA	2.500	58.33	6.66	1.1	60	51	6-
	+(10%)	ARA	1.250	55.33	7.37	1.1	58	47	6
	+(10%)	ARA	0.625	55.00	5.29	1.1	49	57	5
	+(10%)	ARA	0.313	60.67	6.43	1.2	68	58	5
	+(10%)	ARA	0.156	55.33	5.69	1.1	49	60	5
nitivo control without mot	ahalia aativatian		12/3/2013						
sitive control without meta	abolic activation.		12/3/2013			Ratio			
					04 1 1				
				Mean Plate	Standard	Treated /			_
									Coun
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individu		
Tester Strain WP2	-	4NQO	Dose per plate (ug) 2.5	1181.33	12.86	24.6	1172	1176	119
	-	4NQO Untreated		1181.33 40.67	12.86 3.51		1172 41	1176 37	119
	-	4NQO		1181.33	12.86	24.6	1172	1176	119
WP2	-	4NQO Untreated	2.5	1181.33 40.67 48.00	12.86 3.51 3.61	24.6	1172 41	1176 37	119
WP2	-	4NQO Untreated	2.5	1181.33 40.67	12.86 3.51 3.61	24.6 0.8	1172 41	1176 37	119
WP2	-	4NQO Untreated	2.5	1181.33 40.67 48.00 Percent S9:	12.86 3.51 3.61 5%	24.6 0.8 Ratio	1172 41	1176 37	119
WP2		4NQO Untreated Solvent	2.5 12/3/2013	1181.33 40.67 48.00 Percent S9:	12.86 3.51 3.61 5% Standard	24.6 0.8 Ratio	1172 41 51	1176 37 49	119 44 44
WP2 sitive control with metabo		4NQO Untreated Solvent	2.5 12/3/2013 Dose per plate (ug)	1181.33 40.67 48.00 Percent S9: Mean Plate Count	12.86 3.51 3.61 5% Standard Deviation	24.6 0.8 Ratio Treated / Solvent	1172 41 51	1176 37 49	119 44 44
WP2		4NQO Untreated Solvent Compound 2-Anthramine	2.5 12/3/2013	1181.33 40.67 48.00 Percent S9: Mean Plate Count 652.00	12.86 3.51 3.61 5% Standard Deviation 78.08	Ratio Treated / Solvent	1172 41 51 Individu 648	1176 37 49 Jal Plate 576	119 44 44 Coun
WP2 sitive control with metabo		4NQO Untreated Solvent Compound 2-Anthramine Untreated	2.5 12/3/2013 Dose per plate (ug)	1181.33 40.67 48.00 Percent S9: Mean Plate Count 652.00 64.67	12.86 3.51 3.61 5% Standard Deviation 78.08 14.19	24.6 0.8 Ratio Treated / Solvent	1172 41 51	1176 37 49 Jal Plate 576 80	115 4. 4. Coun 73 6.
WP2 sitive control with metabo		4NQO Untreated Solvent Compound 2-Anthramine	2.5 12/3/2013 Dose per plate (ug)	1181.33 40.67 48.00 Percent S9: Mean Plate Count 652.00	12.86 3.51 3.61 5% Standard Deviation 78.08	Ratio Treated / Solvent	1172 41 51 Individu 648	1176 37 49 Jal Plate 576	119 44 44
WP2 Sitive control with metabo Tester Strain WP2	S9 (-/+) +(5%) +(5%)	4NQO Untreated Solvent Compound 2-Anthramine Untreated	2.5 12/3/2013 Dose per plate (ug) 20	181.33 40.67 48.00 Percent S9: Mean Plate Count 652.00 64.67 64.33	12.86 3.51 3.61 5% Standard Deviation 78.08 14.19 9.07	Ratio Treated / Solvent	1172 41 51 Individu 648 52	1176 37 49 Jal Plate 576 80	115 4. 4. Coun 73 6.
WP2 Sitive control with metabo Tester Strain WP2	S9 (-/+) +(5%) +(5%)	4NQO Untreated Solvent Compound 2-Anthramine Untreated	2.5 12/3/2013 Dose per plate (ug) 20	1181.33 40.67 48.00 Percent S9: Mean Plate Count 652.00 64.67	12.86 3.51 3.61 5% Standard Deviation 78.08 14.19 9.07	Ratio Treated / Solvent 10.1	1172 41 51 Individu 648 52	1176 37 49 Jal Plate 576 80	119 44 44 Coun 73 62
WP2 sitive control with metabo	S9 (-/+) +(5%) +(5%)	4NQO Untreated Solvent Compound 2-Anthramine Untreated	2.5 12/3/2013 Dose per plate (ug) 20	181.33 40.67 48.00 Percent S9: Mean Plate Count 652.00 64.67 64.33 Percent S9:	12.86 3.51 3.61 5% Standard Deviation 78.08 14.19 9.07	Ratio Treated / Solvent 10.1 Ratio	1172 41 51 Individu 648 52	1176 37 49 Jal Plate 576 80	115 4. 4. Coun 73 6.
Sitive control with metabo Tester Strain WP2 sitive control with metabo		4NQO Untreated Solvent Compound 2-Anthramine Untreated Solvent	2.5 12/3/2013 Dose per plate (ug) 20 12/3/2013	181.33 40.67 48.00 Percent S9: Mean Plate Count 652.00 64.67 64.33 Percent S9:	12.86 3.51 3.61 5% Standard Deviation 78.08 14.19 9.07	Ratio Treated / Solvent 10.1 Ratio Treated /	1172 41 51 Individu 648 52 56	1176 37 49 22 21 Plate 576 80 63	Coun 73 6: 7.
WP2 sitive control with metabo Tester Strain WP2 sitive control with metabo		4NQO Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound	2.5 12/3/2013 Dose per plate (ug) 20 12/3/2013 Dose per plate (ug)	181.33 40.67 48.00 Percent S9: Mean Plate Count 652.00 64.67 64.33 Percent S9: Mean Plate Count	12.86 3.51 3.61 5% Standard Deviation 78.08 14.19 9.07 10% Standard Deviation	Ratio Treated / Solvent 10.1 Ratio Treated / Solvent	1172 41 51 Individu 648 52 56	1176 37 49 20 21 Plate 576 80 63	Coun 73 6. 7.
Sitive control with metabo Tester Strain WP2 sitive control with metabo		4NQO Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine	2.5 12/3/2013 Dose per plate (ug) 20 12/3/2013	181.33 40.67 48.00 Percent S9: Mean Plate Count 652.00 64.67 64.33 Percent S9: Mean Plate Count 614.67	12.86 3.51 3.61 5% Standard Deviation 78.08 14.19 9.07 10% Standard Deviation 90.89	Ratio Treated / Solvent 10.1 10 Ratio Treated / Solvent 10.1 10	1172 41 51 Individe 648 52 56 Individe 712	1176 37 49 121 Plate 576 80 63	Coun Coun Coun 73 60 73
WP2 sitive control with metabo Tester Strain WP2 sitive control with metabo		4NQO Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound	2.5 12/3/2013 Dose per plate (ug) 20 12/3/2013 Dose per plate (ug)	181.33 40.67 48.00 Percent S9: Mean Plate Count 652.00 64.67 64.33 Percent S9: Mean Plate Count	12.86 3.51 3.61 5% Standard Deviation 78.08 14.19 9.07 10% Standard Deviation	Ratio Treated / Solvent 10.1 Ratio Treated / Solvent	1172 41 51 Individu 648 52 56	1176 37 49 20 21 Plate 576 80 63	Coun Coun Coun Coun

Table 21: Individual and mean plate counts for Salmonella TA-98 exposed to Amyris Farnesane (POSF 10329)

t compound without met	abolic activation:		11/5/2013	3					
						Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Count
TA-98	-	Amyris	5.000	28.00	8.72	0.9	24	38	22
	-	Amyris	2.500	30.00	3.46	0.9	34	28	28
	-	Amyris	1.250	30.67	5.51	1.0	27	28	37
	-	Amyris	0.625	33.00	4.00	1.0	29	37	33
	-	Amyris	0.313	29.67	4.51	0.9	34	30	25
	-	Amyris	0.156	36.67	4.16	1,2	38	32	40
		,		00.01					1
t compound with metabo	lic activation		11/5/2019	Percent S9:	5%		•		
t compound with metabe	no dotivation.		110/201	T 0100111 00.	l .	Ratio	1		
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Daga nar plata (ul.)	Count	Deviation	Solvent	Individ	ual Plate	Caunt
TA-98	+(5%)		Dose per plate (uL)			0.9		_	
TA-98		Amyris	5.000	40.00	5.20		46	37	37
	+(5%)	Amyris	2.500	39.00	3.00	0.9	42	36	39
	+(5%)	Amyris	1.250	41.33	4.73	0.9	43	36	45
	+(5%)	Amyris	0.625	37.33	3.21	0.8	41	35	36
	+(5%)	Amyris	0.313	38.00	7.21	0.9	46	36	32
	+(5%)	Amyris	0.156	43.67	5.13	1.0	45	48	38
t compound with metabo	lic activation:		11/5/2013	Percent S9:	10%				
						Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Count
TA-98	+(10%)	Amyris	5.000	42.00	6.24	0.9	35	47	44
	+(10%)	Amyris	2.500	33.67	6.11	0.7	39	35	27
	+(10%)	Amyris	1.250	42.67	1.15	0.9	42	42	44
	+(10%)	Amyris	0.625	42.00	5.20	0.9	36	45	45
	+(10%)	Amyris	0.313	46.33	2.52	1.0	46	49	44
	+(10%)	Amyris	0.156	48.67	9.61	1.0	40	59	47
	+(1070)	Alliylis	0.50	40.07	3.01	1.0	70	33	7/
sitive control without met	tabalia aativatian		11/5/2013		ļ.				
ntive control without me	abolic activation.		173/20 8	, 		Ratio			
				Mean Plate	Ctandand	Treated /			
	22//				Standard				
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent		ual Plate	
TA-98	-	2-Nitrofluorene	3	230.33	27.57	7.3	228	204	259
	-	Untreated		34.67	9.07	1.1	43	36	25
		Solvent		31.67	1.53		30	33	32
							ļ		
itive control with metabo	olic activation:		11/5/2013	Percent S9:	5%				
	1			İ		Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent		ual Plate	_
TA-98	+(5%)	2-Anthramine	0.5	248.33	19.14	5.6	264	227	25
	+(5%)	Untreated		48.00	12.00	1.1	36	48	60
	+(5%)	Solvent		44.67	6.35		41	41	52
itive control with metabo	olic activation:		11/5/2013	Percent S9:	10%				
						Ratio			
	1			M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individ	ual Plate	Count
	+(10%)	2-Anthramine	0.5	136.33	11.24	2.8	139	124	146
		Untreated	0.5	50.00	2.00	1.0	48	52	50
TA-98	1./100/\			30.00	2.00	1.0	40	52	30
	+(10%)			40.67	2.00		E1	40	47
	+(10%)+(10%)	Solvent	ì	48.67	2.08		51	48	47

Table 22: Individual and mean plate counts for Salmonella TA-100 exposed to Amyris Farnesane (POSF 10329)

t compound without me	abolic activation	1 1	10/18/2013	<u> </u>	1	D-4!-			
				L		Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent		ual Plate	
TA-100	-	Amyris	5.000	117.67	11.02	0.9	105	123	12:
	-	Amyris	2.500	124.00	5.57	1.0	125	118	129
	-	Amyris	1.250	111.00	8.89	0.9	118	114	10
	-	Amyris	0.625	118.33	7.64	1.0	110	120	12:
	-	Amyris	0.313	117.33	11.93	0.9	121	127	10-
	-	Amyris	0.156	118.00	13.08	1.0	112	133	109
t compound with metabo	olic activation:		10/18/2013	Percent S9:	5%				
						Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	Count
TA-100	+(5%)	Amvris	5.000	93.33	14.43	0.8	85	85	110
	+(5%)	Amyris	2.500	107.00	14.53	0.9	122	93	106
	+(5%)	Amyris	1.250	118.67	9.07	1.0	129	115	112
	+(5%)	Amyris	0.625	110.00	5.66	0.9	NA	106	114
	+(5%)	Amyris	0.313	105.67	10.69	0.9	100	99	118
	+(5%)	Amyris	0.156	121.33	6.51	1.0	121	128	115
	T (3 /0)	Alliyilə	0.50	IZ 1.33	0.01	L.U	<u> </u>	ı∠0	I I K
t compound with most of	lio octivatia a		40/40/00 #	Bornent Co	40.0/				
t compound with metabo	one activation:	1	10/18/2013	Percent S9:	10 %	Ratio			
				l					
		1		Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent		ual Plate	
TA-100	+(10%)	Amyris	5.000	119.67	19.66	0.9	142	112	10
	+(10%)	Amyris	2.500	108.00	10.54	0.9	97	109	118
	+(10%)	Amyris	1.250	132.67	25.38	1.0	112	161	12:
	+(10%)	Amyris	0.625	108.33	2.31	0.9	107	111	107
	+(10%)	Amyris	0.313	127.33	15.28	1.0	124	144	114
	+(10%)	Amyris	0.156	117.67	13.80	0.9	123	102	128
itive control without me	tabolic activation		10/18/2013	3					
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individu	ual Plate	Count
TA-100	- '	Sodium Azide	3	2236.00	86.53	18.0	2164	2212	233
	_	Untreated		121.67	3.06	1.0	121	119	125
	_	Solvent		124.00	13.53		123	111	138
		CONTON		200	10.00				
itive control with metab	olic activation:		10/18/2017	Percent S9:	5%				
J J J J I WILL I I J J J J J J J J J J J J J J J J	activation.	1	10, 10, 20 k			Ratio			
	İ			Mean Plate	Standard	Treated /	1		
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individ	ual Plate	Count
TA-100		2-Anthramine	0.5	357.00	38.97	3.0	392	364	31
1 A - 100	+(5%)		0.5						
	+(5%)	Untreated		144.33	7.51	1.2	153	140	140
	+(5%)	Solvent		119.67	3.06		119	123	117
itive control with metab	olic activation:		10/18/2013	Percent S9:	10%				
						Ratio			
	1			M ean Plate	Standard	Treated /			
			Dose per plate (ug)	Count	Deviation	Solvent	Individu	ıal Plate	Count
Tester Strain	S9 (-/+)	Compound			13.44	2.1	254	273	N.A
	S9 (-/+) +(10%)	2-Anthramine	0.5	263.50	b.44	2.1			
Tester Strain				263.50 132.00	4.36	1.0	129	130	137
Tester Strain	+(10%)	2-Anthramine							137 124
Tester Strain	+(10%) +(10%)	2-Anthramine Untreated		132.00	4.36		129	130	

Table 23: Individual and mean plate counts for Salmonella TA-1535 exposed to Amyris Farnesane (POSF 10329)

abolic activation:		10/22/2013	3					
					Ratio			
			M ean Plate	Standard	Treated /			
S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Count
1								16
-								13
 -								13
+								11
	_							13
+								20
-	Alliylis	0.56	15.00	7.55	0.0	H	3	20
lia antivotian.		40/22/2042	Danaant CO.	F0/				
ic activation:		10/22/20 13	Percent 59:	5% 	Patio			
			Moon Bloto	Ctondord				
60 ((.)	Tast First	Dana man mlata (vil.)	l .			I mark and a second	ual Diasa	C =
								14
								12
								5
								3
						_		8
+(5%)	Amyris	0.156	17.50	10.61	1.9	10	25	NA
lic activation:	1	12/10/2013	Percent S9:	10%				
	Test Fuel					Individ	ual Plate	Count
	Amyris					6	17	13
	Amyris							13
+(10%)	Amyris	1.250	10.67	2.52	1.2	11	13	8
+(10%)	Amyris	0.625	12.00	3.61	1.3	16	9	11
+(10%)	Amyris	0.313	11.67	2.08	1.3	14	11	10
+(10%)	Amyris	0.156	10.67	2.89	1.2	14	9	9
abolic activation		10/22/2013	3					
					Ratio			
			Mean Plate	Standard	Treated /			
S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individ	ual Plate	Count
		3	460.00	19.97	28.2	465	477	438
-			15.00	2.65	0.9	16		17
_								10
				0.00				-
lic activation:		10/22/2013	Percent S9:	5%				
T					Ratio			
			Mean Plate	Standard				
S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individ	ual Plate	Count
								34
		3.0						11
_ ` '					1.0			11
+(570)	COIVEIR		3.00	2.00				'''
lic activation:		12/10/2013	Percent So-	10%				
no activation.	1	12/10/20 0	l sicent 33.		Ratio			
			Moan Blots	Standard				
80 (-1.)	Compound	Doso por plato (···a)				Individ	ual Blata	Court
		0.5						32
+(10%)	Untreated		15.00 9.00	1.00 2.00	1.7	14 7	15	16
								11
+(10%)	Solvent		9.00	2.00			9	- "
	\$9 (-/+)	S9 (-/+) Test Fuel	S9 (-/+) Test Fuel Dose per plate (uL)	S9 (-/+) Test Fuel Dose per plate (uL) Count	Section	S9 (-/+) Test Fuel	S9 (-/+) Test Fuel	S9 (-/+) Test Fuel Dose per plate (uL) Count Standard Count Solvent Individual Plate Count Solvent I

Table 24: Individual and mean plate counts for Salmonella TA-1537 exposed to Amyris Farnesane (POSF 10329)

st compound without met	abolic activation:		10/28/2013	3					
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Count
TA-1537	1 -	Amyris	5.000	11.33	3.21	0.7	9	10	15
	-	Amyris	2.500	14.00	1.00	0.9	15	14	13
	-	Amyris	1.250	17.00	0.00	1.1	17	17	NA
	_	Amyris	0.625	13.67	6.11	0.9	15	7	19
	_	Amyris	0.313	12.67	2.52	0.8	15	13	10
	+ -	Amyris	0.156	11.67	4.62	0.7	9	9	17
	_	Zinyno	0.60	11.07	4.02	0.7			- "
t compound with metabo	olic activation:		10/28/2013	Percent S9:	E 0/.				
a compound with metabl	nic activation.	1	10/28/20 8	Fercent 39.	3 % 	Ratio			
				Mean Plate	Standard	Treated /			
Tastan Ctusin	60 ((.)	Tast F	Dana man mlata (ul.)	l .			I madical al	ual Diasa	C =
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent		ual Plate	
TA-1537	+(5%)	Amyris	5.000	15.00	4.58	0.8	10	16	19
	+(5%)	Amyris	2.500	18.67	3.79	0.9	23	16	17
	+(5%)	Amyris	1.250	19.00	1.73	1.0	17	20	20
	+(5%)	Amyris	0.625	22.50	2.12	1.1	24	21	NA
	+(5%)	Amyris	0.313	18.67	1.15	0.9	18	20	18
	+(5%)	Amyris	0.156	21.33	2.08	1.1	19	22	23
st compound with metabo	olic activation:		10/28/2013	Percent S9:	10%				
						Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Count
TA-1537	+(10%)	Amyris	5.000	16.00	2.65	0.8	18	17	13
	+(10%)	Amyris	2.500	17.00	2.83	0.9	NA	19	15
	+(10%)	Amyris	1.250	16.00	2.65	0.8	17	18	13
	+(10%)	Amyris	0.625	15.00	2.00	0.8	17	13	15
	+(10%)	Amyris	0.313	18.00	6.56	0.9	19	24	11
	+(10%)	Amyris	0.156	20.33	2.31	1.0	19	23	19
	+(1070)	Alliylis	0.00	20.55	2.01	1.0	10	20	10
sitive control without me	tabolic activation		10/28/2013)					
sitive control without me	abolic activation.	1 1	10/20/20 6	,	l e	Ratio	T		
				Mean Plate	Standard	Treated /			
Tastan Ctusin	60 ((.)		Dana man mlata ()				I madical al	ual Diasa	C
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent		ual Plate	
TA-1537		9-A mino acridine	100	1304.67	323.71	83.3	1640	1280	994
	-	Untreated		20.67	2.89	1.3	19	24	19
		Solvent		15.67	0.58		15	16	16
					_				
sitive control with metabo	olic activation:		10/28/2013	Percent S9:	5%				
				1		Ratio			
_	1 _			Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent		ual Plate	_
TA-1537	+(5%)	2-Anthramine	3	55.67	2.52	2.8	56	58	53
	+(5%)	Untreated		22.67	5.03	1.1	18	28	22
	+(5%)	Solvent		20.00	1.00		20	19	21
sitive control with metabo	olic activation:		10/28/2013	Percent S9:	10%				
		I				Ratio			
	I			M ean Plate	Standard	Treated /			
	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individ	ual Plate	Count
Tester Strain	JJ (-/ +/	2-Anthramine	3	42.33	2.31	2.2	45	41	41
Tester Strain	⊥/4∩0/.\		3				_		
Tester Strain TA-1537	+(10%)			26.00					
	+(10%)	Untreated		26.00	5.20	1.3	29	29	20
				26.00 19.67	5.20 3.79	1.3	29	17	18

Table 25: Individual and mean plate counts for E. coli WP2 exposed to Amyris Farnesane (POSF 10329)

t compound without met	abolic activation:	1	12/3/2013	,	T	D - 41-			
				M ean Plate	Standard	Ratio Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Coun
WP2	- '	Amyris	5.000	40.00	2.00	0.8	42	38	4
	_	Amyris	2.500	39.67	12.22	0.8	53	37	2
	-	Amyris	1.250	35.67	5.13	0.7	40	37	3
	_	Amyris	0.625	39.33	3.06	0.8	42	36	4
	-	Amyris	0.313	41.00	5.57	0.9	40	36	4
		Amyris	0.156	41.33	7.37	0.9	33	44	4
	_	711119110	0.100	1 1100	7.0.	0.0			· ·
t compound with metabo	olic activation:		12/3/201	Percent S9:	5%				
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Coun
WP2	+(5%)	Amyris	5.000	52.33	2.52	0.8	55	50	5
	+(5%)	Amyris	2.500	47.67	8.08	0.7	55	49	3
	+(5%)	Amyris	1.250	54.00	10.44	0.8	42	61	5
	+(5%)	Amyris	0.625	48.67	4.04	0.8	45	48	5
	+(5%)		0.813	53.00	4.04	0.8	51	50	5
	+(5%)	Amyris	0.313	53.00	4.36	0.8	64	57	4
	+(5%)	Amyris	0.00	54.67	10.69	0.8	64	5/	4.
t compound with metabo	olic activation:		12/3/201	Percent S9:	10%				
t compound minimotable	7110 GOTT GTTOTIL		12,0,20	1	10 70	Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dogo por ploto (ul.)	Count	Deviation	Solvent	Individu	ual Plate	C
WP2			Dose per plate (uL) 5.000						
WP2	+(10%)	Amyris		52.00	9.64	1.0	45	63	4
	+(10%)	Amyris	2.500	49.33	8.33	1.0	52	40	5
	+(10%)	Amyris	1.250	51.00	6.08	1.0	54	55	4
	+(10%)	Amyris	0.625	47.67	7.51	0.9	55	48	4
	+(10%)	Amyris	0.313	54.00	10.54	1.0	64	43	5
	+(10%)	Amyris	0.156	51.33	4.93	1.0	49	48	5
	tabalia astirotia e		40/0/00#						
sitive control without me	tabolic activation.	1	12/3/2013		I	Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individu	ual Plate	Caun
WP2	39 (-/+)	4NQO	2.5		12.86	24.6	1172	1176	119
VVP2			2.5	1181.33					
	-	Untreated		40.67	3.51	0.8	41	37	4
	-	Solvent	·	48.00	3.61		51	49	4
aiting agains a luith match	alia activation:		40/3/304	Darsont CO.	E 0/				
sitive control with metabo	Jiic activation.		12/3/20 k	Percent S9:	J /0	Ratio			
				M ean Plate	Ctandand	Treated /			
					Standard				_
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent		ual Plate	
WP2	+(5%)	2-Anthramine	20	652.00	78.08	10.1	648	576	73
	+(5%)	Untreated		64.67	14.19	1.0	52	80	6:
	+(5%)	Solvent		64.33	9.07		56	63	7-
- Marine and a state of the second state of th	- Programme		4010100	B	400/				
sitive control with metabo	olic activation:	1	12/3/201	Percent S9:	10%	Ratio			
				Maan Blate	Ctondon.		1		
				M ean Plate	Standard	Treated /	l		_
		Compound	Dose per plate (ug)	Count	Deviation	Solvent		ual Plate	
Tester Strain	S9 (-/+)			614.67	90.89	11.9	712	600	53
Tester Strain WP2	+(10%)	2-Anthramine	20						
	+(10%) +(10%)	2-Anthramine Untreated	20	61.00	1.73	1.2	62	59	
	+(10%)	2-Anthramine	20						6.

Table 26: Individual and mean plate counts for Salmonella TA-98 exposed to Virent HDO-SK (POSF 10330)

	abolic activation:		11/8/2013	3					
			·			Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	Coun
TA-98		Virent	2.500	23.67	3.21	0.8	25	26	20
	-	Virent	1.250	29.33	2.52	1.0	32	27	29
	-	Virent	0.625	28.33	6.51	1.0	22	28	3
	-	Virent	0.313	24.00	3.46	0.8	28	22	2
	_	Virent	0.156	34.00	4.36	1.1	31	32	39
	_	Virent	0.078	35.67	3.51	1.2	39	36	32
		VIIGH	0.070	33.07	3.31	1.2	- 55	- 50	- 52
at compound with metabo	lic activation:		11/15/2013	Percent S9:	5%				
					- 70	Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	Coun
TA-98	+(5%)	Virent	2.500	62.33	9.07	14	54	61	72
1A-30	+(5%)	Virent	1.250	58.33	3.51	1.3	58	62	55
	+(5%)	Virent	0.625	44.50	3.54	1.0	42	NA	47
									_
	+(5%)	Virent	0.313	37.50	7.78	0.8	32	43	N/
	+(5%)	Virent	0.156	44.33	7.51	1.0	40	53	40
	+(5%)	Virent	0.078	52.00	4.24	1.2	55	49	N/
	Para Cartina		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	D	40.07				
t compound with metabo	olic activation:		11/8/2013	Percent S9:	10%	Dari's			
						Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent		ual Plate	
TA-98	+(10%)	Virent	2.500	36.00	5.00	0.9	36	41	3
	+(10%)	Virent	1.250	42.33	6.11	1.0	41	49	3
	+(10%)	Virent	0.625	39.00	5.00	1.0	34	39	4
	+(10%)	Virent	0.313	41.00	7.00	1.0	34	41	48
	+(10%)	Virent	0.156	34.67	8.96	0.9	45	29	30
	+(10%)	Virent	0.078	48.67	2.52	1.2	49	46	5
sitive control without met	abolic activation:		11/8/2013	3					
						Ratio			
				Mean Plate	Standard	Treated /			
				Count	Deviation	Solvent	Individ	ol Bloso	Coun
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation			Jairiale	
Tester Strain TA-98	S9 (-/+)	Compound 2-Nitrofluorene	Dose per plate (ug)	258.00	12.53	8.7	259	270	
	S9 (-/+) - -								24
	-	2-Nitrofluorene		258.00	12.53	8.7	259	270	24 32
	-	2-Nitrofluorene Untreated		258.00 30.33	12.53 5.69	8.7	259 24	270 35	24 32
	-	2-Nitrofluorene Untreated	3	258.00 30.33	12.53 5.69 3.51	8.7	259 24	270 35	24 32 30
TA-98	-	2-Nitrofluorene Untreated	3	258.00 30.33 29.67	12.53 5.69 3.51	8.7	259 24	270 35	24 32
TA-98	-	2-Nitrofluorene Untreated	3	258.00 30.33 29.67	12.53 5.69 3.51	8.7 1.0	259 24	270 35	24 32
TA-98	-	2-Nitrofluorene Untreated	3	258.00 30.33 29.67 3 Percent S9:	12.53 5.69 3.51 5%	8.7 1.0 Ratio	259 24 33	270 35	32 30
TA-98	- - - blic activation:	2-Nitrofluorene Untreated Solvent	3 11/15/2013	258.00 30.33 29.67 3 Percent S9:	12.53 5.69 3.51 5% Standard	8.7 1.0 Ratio Treated /	259 24 33	270 35 26	24 32 30 Coun
TA-98 Sitive control with metabo Tester Strain	S9 (-/+) +(5%)	2-Nitrofluorene Untreated Solvent Compound 2-Anthramine	3 11/15/2015 Dose per plate (ug)	258.00 30.33 29.67 3 Percent S9: Mean Plate Count 206.00	12.53 5.69 3.51 5% Standard Deviation 1.73	Ratio Treated / Solvent	259 24 33 Individu 207	270 35 26 ual Plate 207	24 32 30 Coun 20
TA-98 Sitive control with metabo Tester Strain		2-Nitrofluorene Untreated Solvent Compound 2-Anthramine Untreated	3 11/15/2015 Dose per plate (ug)	258.00 30.33 29.67 3 Percent S9: Mean Plate Count 206.00 53.67	12.53 5.69 3.51 5% Standard Deviation 173 9.71	Ratio Treated / Solvent	259 24 33 Individu 207 43	270 35 26 26 ual Plate 207 56	24 32 30 Coun 20 62
TA-98 Sitive control with metabo Tester Strain	S9 (-/+) +(5%)	2-Nitrofluorene Untreated Solvent Compound 2-Anthramine	3 11/15/2015 Dose per plate (ug)	258.00 30.33 29.67 3 Percent S9: Mean Plate Count 206.00	12.53 5.69 3.51 5% Standard Deviation 1.73	Ratio Treated / Solvent	259 24 33 Individu 207	270 35 26 ual Plate 207	24 33 30 Coun 20 65
TA-98 Sitive control with metabo Tester Strain TA-98	S9 (-/+) +(5%) +(5%) +(5%)	2-Nitrofluorene Untreated Solvent Compound 2-Anthramine Untreated	3 11/15/2013 Dose per plate (ug) 0.5	258.00 30.33 29.67 3 Percent S9: Mean Plate Count 206.00 53.67	12.53 5.69 3.51 5% Standard Deviation 1.73 9.71 8.96	Ratio Treated / Solvent	259 24 33 Individu 207 43	270 35 26 26 ual Plate 207 56	24 33 30 Coun 20 65
TA-98 Sitive control with metabo Tester Strain	S9 (-/+) +(5%) +(5%) +(5%)	2-Nitrofluorene Untreated Solvent Compound 2-Anthramine Untreated	3 11/15/2013 Dose per plate (ug) 0.5	258.00 30.33 29.67 3 Percent S9: Mean Plate Count 206.00 53.67 44.33	12.53 5.69 3.51 5% Standard Deviation 1.73 9.71 8.96	8.7 10 Ratio Treated / Solvent 4.6 12	259 24 33 Individu 207 43	270 35 26 26 ual Plate 207 56	24 32 30 Coun 20 62
TA-98 Sitive control with metabo Tester Strain TA-98	S9 (-/+) +(5%) +(5%) +(5%)	2-Nitrofluorene Untreated Solvent Compound 2-Anthramine Untreated	3 11/15/2013 Dose per plate (ug) 0.5	258.00 30.33 29.67 8 Percent S9: Mean Plate Count 206.00 53.67 44.33 Percent S9:	12.53 5.69 3.51 5% Standard Deviation 1.73 9.71 8.96	8.7 10 Ratio Treated / Solvent 4.6 12	259 24 33 Individu 207 43	270 35 26 26 ual Plate 207 56	24 33 30 Coun 20 65
TA-98 Sitive control with metabo Tester Strain TA-98 Sitive control with metabo		2-Nitrofluorene Untreated Solvent Compound 2-Anthramine Untreated Solvent	3 11/15/2013 Dose per plate (ug) 0.5	258.00 30.33 29.67 3 Percent S9: Mean Plate Count 206.00 53.67 44.33 Percent S9: Mean Plate	12.53 5.69 3.51 5% Standard Deviation 173 9.71 8.96	Ratio Treated / Solvent 4.6 12 Ratio Treated /	259 24 33 Individu 207 43 50	270 35 26 26 207 56 34	24 33 30 Coun 20 62 49
TA-98 Sitive control with metabor Tester Strain TA-98 Sitive control with metabor Tester Strain	S9 (-/+) +(5%) +(5%) +(5%) S0lic activation:	2-Nitrofluorene Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound	Dose per plate (ug) 0.5 11/8/20% Dose per plate (ug)	258.00 30.33 29.67 3 Percent S9: Mean Plate Count 206.00 53.67 44.33 Percent S9: Mean Plate Count	12.53 5.69 3.51 5% Standard Deviation 1.73 9.71 8.96 10% Standard Deviation	Ratio Treated / Solvent 4.6 12 Ratio Treated / Solvent	259 24 33 Individu 207 43 50	270 35 26 28 29 207 56 34	24 33 30 Coun 20 62 49
TA-98 Sitive control with metabo Tester Strain TA-98 Sitive control with metabo	S9 (-/+) +(5%) +(5%) +(5%) blic activation: S9 (-/+) +(10%)	2-Nitrofluorene Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine	3 11/15/2013 Dose per plate (ug) 0.5	258.00 30.33 29.67 Mean Plate Count 206.00 53.67 44.33 Percent S9: Mean Plate Count 130.33	12.53 5.69 3.51 5% Standard Deviation 173 9.71 8.96 10% Standard Deviation 0.58	Ratio Treated / Solvent 4.6 12 Ratio Treated / Solvent 3.2	259 24 33 Individe 207 43 50 Individe 130	270 35 26 26 207 56 34 207 56	24 32 36 Coun 20 62 49 Coun
TA-98 Sitive control with metabor Tester Strain TA-98 Sitive control with metabor Tester Strain	S9 (-/+) +(5%) +(5%) +(5%) +(5%) +(5%) +(5%) +(5%)	2-Nitrofluorene Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine Untreated Untreated Untreated Untreated Untreated Untreated	Dose per plate (ug) 0.5 11/8/20% Dose per plate (ug)	258.00 30.33 29.67 Mean Plate Count 206.00 53.67 44.33 Percent S9: Mean Plate Count 30.33 47.67	12.53 5.69 3.51 5% Standard Deviation 1.73 9.71 8.96 10% Standard Deviation 0.58 7.57	Ratio Treated / Solvent 4.6 12 Ratio Treated / Solvent	259 24 33 Individu 207 43 50 Individu 30 39	270 35 26 26 207 56 34 207 56 34	24 32 30 Coun 20 62 49 Coun 13
TA-98 Sitive control with metabor Tester Strain TA-98 Sitive control with metabor Tester Strain	S9 (-/+) +(5%) +(5%) +(5%) blic activation: S9 (-/+) +(10%)	2-Nitrofluorene Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine	Dose per plate (ug) 0.5 11/8/20% Dose per plate (ug)	258.00 30.33 29.67 Mean Plate Count 206.00 53.67 44.33 Percent S9: Mean Plate Count 130.33	12.53 5.69 3.51 5% Standard Deviation 173 9.71 8.96 10% Standard Deviation 0.58	Ratio Treated / Solvent 4.6 12 Ratio Treated / Solvent 3.2	259 24 33 Individe 207 43 50 Individe 130	270 35 26 26 207 56 34 207 56	24 33 36 Coun 20 65 48 Coun 13
TA-98 Sitive control with metaborate Strain TA-98 Sitive control with metaborate Strain Tester Strain TA-98	S9 (-/+) +(5%) +(5%) +(5%) +(5%) (-/+) +(10%) +(10%)	2-Nitrofluorene Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine Untreated Solvent	Dose per plate (ug) 0.5 11/8/20% Dose per plate (ug)	258.00 30.33 29.67 8 Percent S9: Mean Plate Count 206.00 53.67 44.33 9 Percent S9: Mean Plate Count 130.33 47.67 40.33	12.53 5.69 3.51 5% Standard Deviation 1.73 9.71 8.96 10% Standard Deviation 0.58 7.57 8.96	Ratio Treated / Solvent 4.6 12 Ratio Treated / Solvent 3.2	259 24 33 Individu 207 43 50 Individu 30 39	270 35 26 26 207 56 34 207 56 34	24 32 30 Coun 20 62 49

Table 27: Individual and mean plate counts for Salmonella TA-100 exposed to Virent HDO-SK (POSF 10330)

st compound without met	abolic activation:		11/19/2013	3					
						Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	Coun
TA-100		Virent	2.500	102.33	19.09	0.7	124	95	88
17-100	-	Virent	1.250	120.00	11.36	0.9	112	133	11
	-	Virent	0.625	111.67	19.14	0.9	94	109	13
	-	_							_
	-	Virent	0.313	130.33	8.96	0.9	120	136	13
	-	Virent	0.156	150.33	8.74	1.1	143	148	16
	-	Virent	0.078	155.00	8.72	1.1	165	151	14
st compound with metabo	lic activation:		11/19/2013	Percent S9:	5%				
						Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	Coun
TA-100	+(5%)	Virent	2.500	128.00	20.52	1.0	129	148	10
177 100	+(5%)	Virent	1.250	137.33	16.29	1.1	156	126	13
	+(5%)	Virent	0.625	117.33	3.21	0.9	116	121	11
									_
	+(5%)	Virent	0.313	129.00	4.58	1.0	133	130	12
	+(5%)	Virent	0.156	121.67	6.11	1.0	115	127	12
	+(5%)	Virent	0.078	140.67	14.15	1.1	157	132	13
st compound with metabo	olic activation:		11/19/2013	Percent S9:	10 %				
						Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	Coun
TA-100	+(10%)	Virent	2.500	147.00	9.17	12	149	155	13
1A-100	+(10%)	Virent	1.250	123.33	23.76	1.0	139	96	13
	+(10%)	Virent	0.625	130.33	14.57	1.1	144	115	13
	+(10%)	Virent	0.313	121.67	11.50	1.0	110	122	13
	+(10%)	Virent	0.156	147.67	21.39	1.2	171	143	12
	+(10%)	Virent	0.078	141.67	12.86	1.2	127	151	14
nitivo control without mot	tabalia aativatian		10/18/2013	3					
sitive control without met	tabolic activation.					Ratio			
Silive control without me	tabolic activation.								
Silive control without me	tabolic activation.			M ean Plate	Standard	Treated /			
		Compound	Dose per plate (ug)				Individ	ual Plate	Coun
Tester Strain	\$9 (-/+)	Compound Sodium Azide	Dose per plate (ug)	Count	Deviation	Solvent		ual Plate	
	S9 (-/+)	Sodium Azide	Dose per plate (ug)	Count 2175.33	Deviation 126.21	Solvent 15.7	2138	2316	20
Tester Strain	S9 (-/+) - -	Sodium Azide Untreated		C o unt 2175.33 139.67	Deviation 126.21 2.31	Solvent	2138 141	2316 137	20
Tester Strain	S9 (-/+)	Sodium Azide		Count 2175.33	Deviation 126.21	Solvent 15.7	2138	2316	20
Tester Strain TA-100	S9 (-/+) - - -	Sodium Azide Untreated	3	2175.33 139.67 138.67	Deviation 126.21 2.31 9.61	Solvent 15.7	2138 141	2316 137	20
Tester Strain	S9 (-/+) - - -	Sodium Azide Untreated	3	C o unt 2175.33 139.67	Deviation 126.21 2.31 9.61	Solvent 15.7 1.0	2138 141	2316 137	207 14 13
Tester Strain TA-100	S9 (-/+) - - -	Sodium Azide Untreated	3	Count 2175.33 139.67 138.67 3 Percent S9:	Deviation 126.21 2.31 9.61 5%	Solvent 15.7 1.0 Ratio	2138 141	2316 137	20
Tester Strain TA-100 sitive control with metabo	S9 (-/+)	Sodium Azide Untreated Solvent	10/18/2013	Count 2175.33 139.67 138.67 3 Percent S9:	126.21 2.31 9.61 5% Standard	Solvent 15.7 1.0 Ratio Treated /	2138 141 137	2316 137 149	20
Tester Strain TA-100 sitive control with metabo	\$9 (-/+)	Sodium Azide Untreated Solvent	10/18/2015 Dose per plate (ug)	Count 2175.33 139.67 138.67 3 Percent S9: Mean Plate Count	Deviation 126.21 2.31 9.61 5% Standard Deviation	Solvent 15.7 1.0 Ratio Treated / Solvent	2138 141 137	2316 137 149	20°
Tester Strain TA-100 sitive control with metabo	S9 (-/+)	Sodium Azide Untreated Solvent	10/18/2013	Count 2175.33 139.67 138.67 3 Percent S9:	126.21 2.31 9.61 5% Standard	Solvent 15.7 1.0 Ratio Treated /	2138 141 137	2316 137 149	20
Tester Strain TA-100 sitive control with metabo	\$9 (-/+)	Sodium Azide Untreated Solvent	10/18/2015 Dose per plate (ug)	Count 2175.33 139.67 138.67 3 Percent S9: Mean Plate Count	Deviation 126.21 2.31 9.61 5% Standard Deviation	Solvent 15.7 1.0 Ratio Treated / Solvent	2138 141 137	2316 137 149	20°
Tester Strain TA-100 sitive control with metabo	\$9 (-/+)	Sodium Azide Untreated Solvent Compound 2-Anthramine	10/18/2015 Dose per plate (ug)	Count 2175.33 139.67 138.67 3 Percent S9: Mean Plate Count 382.67	Deviation	Ratio Treated / Solvent 3.0	2138 141 137 Individu 347	2316 137 149 Jal Plate 424	20 14 13 Coun 37
Tester Strain TA-100 sitive control with metabo	\$9 (-/+)	Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated	10/18/2015 Dose per plate (ug)	Count 2175.33 139.67 138.67 3 Percent S9: Mean Plate Count 382.67 135.67	Deviation	Ratio Treated / Solvent 3.0	2138 141 137 Individu 347 149	2316 137 149 ual Plate 424 128	20 14 13 Coun 37
Tester Strain TA-100 sitive control with metabo Tester Strain TA-100	\$9 (-/+)	Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated	10/18/2010 Dose per plate (ug) 0.5	Count 2175.33 139.67 138.67 3 Percent S9: Mean Plate Count 382.67 135.67 127.67	Deviation 126.21 2.31 9.61 5% Standard Deviation 38.81 11.59 3.51	Ratio Treated / Solvent 3.0	2138 141 137 Individu 347 149	2316 137 149 ual Plate 424 128	20 14 13 Coun 37
Tester Strain TA-100 sitive control with metabo	\$9 (-/+)	Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated	10/18/2010 Dose per plate (ug) 0.5	Count 2175.33 139.67 138.67 3 Percent S9: Mean Plate Count 382.67 135.67	Deviation 126.21 2.31 9.61 5% Standard Deviation 38.81 11.59 3.51	Solvent 15.7 10 Ratio Treated / Solvent 3.0 11	2138 141 137 Individu 347 149	2316 137 149 ual Plate 424 128	20 14 13 Coun 37
Tester Strain TA-100 sitive control with metabo Tester Strain TA-100	\$9 (-/+)	Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated	10/18/2010 Dose per plate (ug) 0.5	Count 2175.33 139.67 138.67 3 Percent S9: Mean Plate Count 382.67 127.67 3 Percent S9:	Deviation 126.21 2.31 9.61 5% Standard Deviation 38.81 11.59 3.51 10%	Solvent 15.7 10 Ratio Treated / Solvent 3.0 1.1	2138 141 137 Individu 347 149	2316 137 149 ual Plate 424 128	20 14 13 Coun 37
Tester Strain TA-100 Sitive control with metaborate Strain TA-100 Sitive control with metaborate Strain	\$9 (-/+)	Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated Solvent	10/18/2013 Dose per plate (ug) 0.5	Count 2175.33 139.67 138.67 3 Percent S9: Mean Plate Count 382.67 135.67 127.67 Mean Plate Mean Plate	Deviation	Solvent 15.7 1.0 Ratio Treated / Solvent 3.0 1.1 Ratio Treated /	2138 141 137 Individu 347 149 124	2316 137 149 Lual Plate 424 128 128	20 14 13 Count 37 13
Tester Strain TA-100 sitive control with metabo Tester Strain TA-100 sitive control with metabo	\$9 (-/+)	Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound	10/18/2015 Dose per plate (ug) 0.5 10/18/2015 Dose per plate (ug)	Count 2175.33 139.67 138.67 3 Percent S9: Mean Plate Count 382.67 135.67 127.67 3 Percent S9: Mean Plate Count	Deviation 126.21 2.31 9.61 5% Standard Deviation 38.81 11.59 3.51 10% Standard Deviation	Solvent 15.7 10 Ratio Treated / Solvent 3.0 11 Ratio Treated / Solvent	2138 141 137 Individu 347 149 124	2316 137 149 241 128 128	200 14 13 13 13 14 15 16 16 16 16 16 16 16 16 16 16 16 16 16
Tester Strain TA-100 Sitive control with metaborate Strain TA-100 Sitive control with metaborate Strain	\$9 (-/+)	Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine	10/18/2013 Dose per plate (ug) 0.5	Count 2175.33 139.67 138.67 3 Percent S9: Mean Plate Count 382.67 135.67 127.67 Mean Plate Count 297.00	Deviation 126.21 2.31 9.61 5%	Ratio Treated / Solvent 3.0 1.1 Ratio Treated / Solvent 2.5	2138 H1 137 Individe 347 H9 124 Individe 295	2316 137 149 149 149 128 128 128 128 128	200 14 13 13 13 15 15 15 15 15 15 15 15 15 15 15 15 15
Tester Strain TA-100 sitive control with metabo Tester Strain TA-100 sitive control with metabo	\$9 (-/+)	Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine Untreated Untreated Untreated Untreated	10/18/2015 Dose per plate (ug) 0.5 10/18/2015 Dose per plate (ug)	Count 2175.33 139.67 138.67 Rean Plate Count 382.67 127.67 Mean Plate Count 297.00 132.67	Deviation	Solvent 15.7 10 Ratio Treated / Solvent 3.0 11 Ratio Treated / Solvent	2138 H1 137 Individi 347 H9 124 Individi 295 134	2316 137 149 ual Plate 424 128 128 128 ual Plate 295 130	200 14 13 13 13 15 15 15 15 15 15 15 15 15 15 15 15 15
Tester Strain TA-100 sitive control with metabo Tester Strain TA-100 sitive control with metabo	\$9 (-/+)	Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine	10/18/2015 Dose per plate (ug) 0.5 10/18/2015 Dose per plate (ug)	Count 2175.33 139.67 138.67 3 Percent S9: Mean Plate Count 382.67 135.67 127.67 Mean Plate Count 297.00	Deviation 126.21 2.31 9.61 5%	Ratio Treated / Solvent 3.0 1.1 Ratio Treated / Solvent 2.5	2138 H1 137 Individe 347 H9 124 Individe 295	2316 137 149 149 149 128 128 128 128 128	200 144 133 Coun 377 133 13

Table 28: Individual and mean plate counts for Salmonella TA-1535 exposed to Virent HDO-SK (POSF 10330)

est compound without meta	abolic activation:		10/24/2013						
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	Counts
TA-1535		Virent	2.500	10.67	0.58	0.9	11	11	10
	-	Virent	1.250	7.67	2.08	0.6	6	10	7
	-	Virent	0.625	8.33	1.53	0.7	7	8	10
	-	Virent	0.313	11.67	4.62	1.0	9	9	17
	-	Virent	0.156	9.33	4.73	0.8	4	11	13
	+	Virent	0.078	9.33	8.66	1.2	24	9	9
		virent	0.078	14.00	8.00	l.Z		9	9
est compound with metabo	lic activation:		11/22/2013	Percent S9:	5%				
est compound with metabo	iic activation.		1722/2010	l ercent os.	3 /0	Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	Count
TA-1535		Virent							6
TA-635	+(5%)		2.500	9.00	6.08	0.6	5	16	_
	+(5%)	Virent	1.250	9.67	1.53	0.6	11	8	10
	+(5%)	Virent	0.625	11.33	5.13	0.8	17	10	7
	+(5%)	Virent	0.313	12.00	4.36	0.8	14	7	15
	+(5%)	Virent	0.156	12.00	3.00	8.0	15	9	12
	+(5%)	Virent	0.078	16.67	10.69	1.1	29	11	10
est compound with metabo	lic activation:	1	10/24/2013	Percent S9:	10%	T			
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	Counts
TA-1535	+(10%)	Virent	2.500	11.50	0.71	0.8	NA	12	11
	+(10%)	Virent	1.250	11.00	3.61	0.7	8	15	10
	+(10%)	Virent	0.625	14.33	3.51	0.9	14	18	11
	+(10%)	Virent	0.313	12.33	6.11	0.8	7	19	11
	+(10%)	Virent	0.156	10.67	1.53	0.7	9	12	11
	+(10%)	Virent	0.078	12.00	1.00	0.8	12	13	11
	1 (10 70)	VIIIOIN	0.0.0	2.00		0.0			· · · · ·
ositive control without met	abolic activation		10/24/2013						
				1		Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individu	ual Plate	Count
TA-1535	- 39 (-/+)	Sodium Azide	3	445.33	25.03	37.1	444	421	471
TA- 555	-		3			0.7			
	-	Untreated		8.00	2.65	0.7	11	7	6
	-	Solvent		12.00	2.65		15	10	11
200	Para Charles		4/00/0040	D 1 00	F0/				
ositive control with metabo	ilic activation:	1 1	17/22/2013	Percent S9:	5%	D			
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent		ual Plate	
TA-1535	+(5%)	2-Anthramine	0.5	43.67	3.21	2.9	40	46	45
	+(5%)	Untreated		17.67	4.04	1.2	20	20	13
	+(5%)	Solvent		15.00	5.57		20	16	9
ositive control with metabo	lic activation:		10/24/2013	Percent S9:	10%				
						Ratio	1		
				M ean Plate	Standard	Treated /	1		
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individ	ual Plate	Count
TA-1535	+(10%)	2-Anthramine	0.5	31.67	4.04	2.1	28	36	31
	+(10%)	Untreated		17.00	5.29	1.1	15	13	23
									_
	+(10%)	Solvent		15.33	2.52		18	13	15
	+(10%)	Solvent		15.33	2.52		18	13	15

Table 29: Individual and mean plate counts for Salmonella TA-1537 exposed to Virent HDO-SK (POSF 10330)

	bolic activation:		11/1/2013	3					
						Ratio	1		
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	Coun
TA-1537	-	Virent	2.500	10.33	3.79	0.8	12	13	6
177 807	-	Virent	1.250	11.33	1.53	0.9	13	11	10
	_	Virent	0.625	12.00	2.65	0.9	15	10	1
	-					0.9			
	-	Virent	0.313	10.67	1.53		9	11	12
	-	Virent	0.156	12.33	4.93	0.9	9	18	10
		Virent	0.078	13.00	3.61	1.0	12	17	10
st compound with metabol	ic activation:		11/1/2013	Percent S9:	5%				
						Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	Coun
TA-1537	+(5%)	Virent	2.500	17.33	3.51	0.8	21	17	14
177 807	+(5%)	Virent	1250	13.50	0.71	0.6	14	NA	13
	+(5%)	Virent	0.625	16.00	2.83	0.7	14	15	18
									_
	+(5%)	Virent	0.313	14.00	173	0.6	13	13	16
	+(5%)	Virent	0.156	18.67	0.58	0.8	19	19	18
	+(5%)	Virent	0.078	17.67	5.03	0.8	23	13	17
st compound with metabol	ic activation:		11/1/2013	Percent S9:	10%				
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	Coun
TA-1537	+(10%)	Virent	2.500	21.67	2.52	12	24	19	22
TA- 557	+(10%)	Virent	1.250	16.33	1.53	0.9	18	15	16
	_ ` /								
	+(10%)	Virent	0.625	16.67	8.74	0.9	7	19	24
	+(10%)	Virent	0.313	17.33	2.08	0.9	18	19	15
	+(10%)	Virent	0.156	18.67	3.06	1.0	16	22	18
	+(10%)	Virent	0.078	21.00	3.00	1.1	24	18	2
sitive control without meta	abolic activation:		11/1/2013	3					
						Ratio			
					Standard	Treated /			
				Mean Plate	Standard				
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Mean Plate			Individu	ıal Plate	Coun
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent		ual Plate	_
Tester Strain TA-1537	-	9-Amino acridine	Dose per plate (ug) 100	Count 929.00	Deviation 126.01	Solvent 71.5	1056	927	80
	-	9-Amino acridine Untreated		929.00 17.33	Deviation 126.01 4.62	Solvent	1056 12	927 20	80
	-	9-Amino acridine		Count 929.00	Deviation 126.01	Solvent 71.5	1056	927	80
TA-1537		9-Amino acridine Untreated	100	929.00 17.33 13.00	Deviation 126.01 4.62 1.73	Solvent 71.5	1056 12	927 20	80 20 14
		9-Amino acridine Untreated	100	929.00 17.33	Deviation 126.01 4.62 1.73	71.5 1.3	1056 12	927 20	80 20
TA-1537		9-Amino acridine Untreated	100	Count 929.00 17.33 13.00 3 Percent S9:	Deviation 126.01 4.62 1.73	Solvent 715 13 Ratio	1056 12	927 20	80 20
TA-1537 sitive control with metabol	- - - lic activation:	9-A mino acridine Untreated Solvent	100	Count 929.00 17.33 13.00 3 Percent S9: Mean Plate	Deviation 126.01 4.62 173 5% Standard	Solvent 715 13 Ratio Treated /	1056 12 11	927 20 14	80 20 14
TA-1537		9-Amino acridine Untreated	100	Count 929.00 17.33 13.00 3 Percent S9:	Deviation 126.01 4.62 1.73	Solvent 715 13 Ratio	1056 12 11	927 20	80 20 14
TA-1537 Sitive control with metabol	- - - lic activation:	9-A mino acridine Untreated Solvent	100	Count 929.00 17.33 13.00 3 Percent S9: Mean Plate	Deviation 126.01 4.62 173 5% Standard	Solvent 715 13 Ratio Treated /	1056 12 11	927 20 14	80 20 14
TA-1537 sitive control with metabol Tester Strain	- - - lic activation:	9-Amino acridine Untreated Solvent	100 11/1/201; Dose per plate (ug)	Count 929.00 17.33 13.00 Percent S9: Mean Plate Count	Deviation	Ratio Treated / Solvent	1056 12 11 Individu	927 20 14	80 20 14 Coun
TA-1537 sitive control with metabol Tester Strain	- - - - lic activation: S9 (-/+) +(5%)	9-Amino acridine Untreated Solvent Compound 2-Anthramine Untreated	100 11/1/201; Dose per plate (ug)	Count 929.00 17.33 13.00 B Percent S9: Mean Plate Count 52.67	Deviation	Ratio Treated / Solvent 2.3	1056 12 11 11 Individu 55	927 20 14 Jal Plate 50	80 21 14 Coun
TA-1537 Sitive control with metabol Tester Strain	- - - - - - - - - - - - - - - - - - -	9-Amino acridine Untreated Solvent Compound 2-Anthramine	100 11/1/201; Dose per plate (ug)	Count 929.00 17.33 13.00 3 Percent S9: Mean Plate Count 52.67 17.67	Deviation	Ratio Treated / Solvent 2.3	1056 12 11 11 Individu 55 20	927 20 14 4 ual Plate 50	80 20 14
TA-1537 Sitive control with metabol Tester Strain TA-1537	S9 (-/+) + (5%) + (5%)	9-Amino acridine Untreated Solvent Compound 2-Anthramine Untreated	100 11/1/201 Dose per plate (ug) 3	Count 929.00 17.33 13.00 8 Percent S9: Mean Plate Count 52.67 17.67 22.67	Deviation 126.01 4.62 173 5% Standard Deviation 2.52 2.52 3.21	Ratio Treated / Solvent 2.3	1056 12 11 11 Individu 55 20	927 20 14 4 ual Plate 50	80 21 14 Coun
TA-1537 Sitive control with metabol Tester Strain TA-1537	S9 (-/+) + (5%) + (5%)	9-Amino acridine Untreated Solvent Compound 2-Anthramine Untreated	100 11/1/201 Dose per plate (ug) 3	Count 929.00 17.33 13.00 3 Percent S9: Mean Plate Count 52.67 17.67	Deviation 126.01 4.62 173 5% Standard Deviation 2.52 2.52 3.21	Ratio Treated / Solvent 23 0.8	1056 12 11 11 Individu 55 20	927 20 14 4 ual Plate 50	80 21 14 Coun
TA-1537 Sitive control with metabol Tester Strain TA-1537	S9 (-/+) + (5%) + (5%)	9-Amino acridine Untreated Solvent Compound 2-Anthramine Untreated	100 11/1/201 Dose per plate (ug) 3	Count 929.00 17.33 13.00 Percent S9: Mean Plate Count 52.67 17.67 22.67	Deviation 126.01 4.62 1.73 5% Standard Deviation 2.52 2.52 3.21 10%	Ratio Treated / Solvent 2.3 0.8 Ratio	1056 12 11 11 Individu 55 20	927 20 14 4 ual Plate 50	80 21 14 Coun
TA-1537 Sitive control with metabol Tester Strain TA-1537 Sitive control with metabol		9-Amino acridine Untreated Solvent Compound 2-Anthramine Untreated Solvent	100 11/1/201 Dose per plate (ug) 3	Count 929.00 17.33 13.00 8 Percent S9: Mean Plate Count 52.67 17.67 22.67 Mean Plate Mean Plate	Deviation 126.01 4.62 1.73 5% Standard Deviation 2.52 2.52 3.21 10% Standard	Ratio Treated / Solvent 2.3 0.8 Ratio Treated / Treated / Treated /	1056 12 11 11 Individu 55 20 19	927 20 14 2al Plate 50 18 24	80 20 14 Coun 53 18 20
TA-1537 Sitive control with metabol Tester Strain TA-1537 Sitive control with metabol	S9 (-/+) +(5%) +(5%) +(5%) +(5%) S9 (-/+)	9-Aminoacridine Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound	Dose per plate (ug) 3 11/1/2015 Dose per plate (ug)	Count 929.00 17.33 13.00 8 Percent S9: Mean Plate Count 52.67 17.67 22.67 8 Percent S9: Mean Plate Count	Deviation 126.01 4.62 173 5%	Ratio Treated / Solvent 2.3 0.8 Ratio Treated / Solvent Solvent	1056 12 11 Individu 55 20 19	927 20 14 2al Plate 50 18 24	20 14 Coun 5: 2: Coun
TA-1537 Sitive control with metabol Tester Strain TA-1537 sitive control with metabol		9-Amino acridine Untreated Solvent Compound 2-Anthramine Untreated Solvent	100 11/1/201 Dose per plate (ug) 3	Count 929.00 17.33 13.00 8 Percent S9: Mean Plate Count 52.67 17.67 22.67 Mean Plate Count 33.67	Deviation 126.01 4.62 1.73 1.5%	Ratio Treated / Solvent 2.3 0.8 Ratio Treated / Solvent 18	1056 12 11 11 Individu 55 20 19	927 20 14 14 50 18 24	80 20 14 Coun 53 18 20
TA-1537 Sitive control with metabol Tester Strain TA-1537 Sitive control with metabol	S9 (-/+) +(5%) +(5%) +(5%) +(5%) S9 (-/+)	9-Aminoacridine Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound	Dose per plate (ug) 3 11/1/2015 Dose per plate (ug)	Count 929.00 17.33 13.00 8 Percent S9: Mean Plate Count 52.67 17.67 22.67 8 Percent S9: Mean Plate Count	Deviation 126.01 4.62 173 5%	Ratio Treated / Solvent 2.3 0.8 Ratio Treated / Solvent Solvent	1056 12 11 Individu 55 20 19	927 20 14 2al Plate 50 18 24	20 14 Coun 5: 2: Coun
TA-1537 Sitive control with metabol Tester Strain TA-1537 Sitive control with metabol		9-Amino acridine Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine	Dose per plate (ug) 3 11/1/2015 Dose per plate (ug)	Count 929.00 17.33 13.00 8 Percent S9: Mean Plate Count 52.67 17.67 22.67 Mean Plate Count 33.67	Deviation 126.01 4.62 1.73 1.5%	Ratio Treated / Solvent 2.3 0.8 Ratio Treated / Solvent 18	1056 12 11 Individu 55 20 19	927 20 14 14 50 18 24	80 2 1 1 Coun 5 1 2

Table 30: Individual and mean plate counts for E. coli WP2 exposed to Virent HDO-SK (POSF 10330)

st compound without meta	abolic activation:		12/11/2013						
				M ean Plate	Standard	Ratio Treated /			-
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Coun
WP2	-	Virent	2.500	36.33	2.52	0.9	36	34	39
**** 2	-	Virent	1.250	39.00	5.29	0.9	41	33	43
	_	Virent	0.625	40.67	6.03	1.0	40	47	35
	-	Virent	0.313	39.00	8.72	0.9	43	45	29
	 	Virent	0.156	39.00	8.72	0.9	33	49	3
	-	Virent	0.078	42.33	1.15	1.0	41	43	4:
	-	VIIGIIL	0:078	42.55	1. 10	1.0	41	43	4.
st compound with metabo	lic activation:		12/11/2013	Percent S9:	5%				
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Coun
WP2	+(5%)	Virent	2.500	47.00	2.65	1.1	48	49	4
	+(5%)	Virent	1.250	39.33	4.73	0.9	34	43	4
	+(5%)	Virent	0.625	56.33	4.62	1.4	59	59	5
	+(5%)	Virent	0.313	54.00	2.65	1.3	57	52	5
	+(5%)	Virent	0.156	49.33	9.45	1.2	46	42	6
	+(5%)	Virent	0.078	42.67	2.89	1.0	46	41	4
	T (3 /0)	VIIGIIL	0.076	42.01	2.03	I.U	40	41	4
st compound with metabo	lic activation:		12/11/2015	Percent S9:	10%				
ot compound with metabo	lio dottvation.	1	2/11/2010	l crociii co.	10 /0	Ratio			
				Mean Plate	Standard	Treated /			
T 1 01 1	00//		B (-1)						
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent		ual Plate	
WP2	+(10%)	Virent	2.500	44.67	6.11	1.1	46	50	38
	+(10%)	Virent	1.250	42.67	0.58	1.1	43	42	43
	+(10%)	Virent	0.625	47.33	7.02	1.2	40	48	54
	+(10%)	Virent	0.313	49.33	7.09	1.3	43	48	5
	+(10%)	Virent	0.156	47.00	8.72	1.2	43	41	57
	+(10%)	Virent	0.078	50.67	6.43	1.3	46	48	58
	1 11 11 11		10 / 1//00 15						
sitive control without meta	abolic activation:		12/11/2013			5			
						Ratio			
				l		l —			
				M ean Plate	Standard	Treated /			_
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent		ual Plate	
	-	4NQO	Dose per plate (ug) 2.5	Count 1025.33	Deviation 123.70	Solvent 24.0	960	1168	94
Tester Strain	-	4NQO Untreated		Count 1025.33 41.33	123.70 4.73	Solvent	960 43	1168 45	94
Tester Strain	-	4NQO		Count 1025.33	Deviation 123.70	Solvent 24.0	960	1168	94
Tester Strain WP2	-	4NQO Untreated	2.5	Count 1025.33 41.33 42.67	123.70 4.73 4.04	Solvent 24.0	960 43	1168 45	94 36
Tester Strain WP2	-	4NQO Untreated	2.5	Count 1025.33 41.33	123.70 4.73 4.04	Solvent 24.0 1.0	960 43	1168 45	94 36
Tester Strain WP2	-	4NQO Untreated	2.5	Count 1025.33 41.33 42.67	123.70 4.73 4.04	Solvent 24.0 1.0 Ratio	960 43	1168 45	94 36
Tester Strain WP2 sitive control with metabo	lic activation:	4NQO Untreated Solvent	2.5	Count 1025.33 41.33 42.67 Percent S9:	123.70 4.73 4.04 5% Standard	24.0 1.0 Ratio	960 43 45	1168 45 45	94 36 38
Tester Strain WP2 sitive control with metabo	lic activation:	4NQO Untreated Solvent	2.5 12/11/2015 Dose per plate (ug)	Count 1025.33 41.33 42.67 Percent S9: Mean Plate Count	123.70 4.73 4.04 5% Standard Deviation	24.0 10 Ratio Treated / Solvent	960 43 45	1168 45 45 45	94 36 38
Tester Strain WP2 sitive control with metabo	lic activation:	4NQO Untreated Solvent	2.5	Count 1025.33 41.33 42.67 Percent S9:	123.70 4.73 4.04 5% Standard	24.0 1.0 Ratio	960 43 45	1168 45 45	94 36 38
Tester Strain WP2 sitive control with metabo	- - -	4NQO Untreated Solvent Compound 2-Anthramine Untreated	2.5 12/11/2015 Dose per plate (ug)	Count 1025.33 4133 42.67 Percent S9: Mean Plate Count 552.67 52.33	Deviation 123.70 4.73 4.04 5% Standard Deviation 109.57 9.71	24.0 10 Ratio Treated / Solvent	960 43 45 Individe 574 44	1168 45 45 45 ual Plate 650 50	94 36 38 Coun 43 63
Tester Strain WP2 sitive control with metabo	- - - - lic activation: S9 (-/+) +(5%)	4NQO Untreated Solvent Compound 2-Anthramine	2.5 12/11/2015 Dose per plate (ug)	Count 1025.33 41.33 42.67 Percent S9: Mean Plate Count 552.67	Deviation	Ratio Treated / Solvent 13.3	960 43 45 Individe 574	1168 45 45 45 ual Plate 650	94 36 38
Tester Strain WP2 sitive control with metabo	- - -	4NQO Untreated Solvent Compound 2-Anthramine Untreated	2.5 12/11/2015 Dose per plate (ug)	Count 1025.33 4133 42.67 Percent S9: Mean Plate Count 552.67 52.33	Deviation 123.70 4.73 4.04 5% Standard Deviation 109.57 9.71	Ratio Treated / Solvent 13.3	960 43 45 Individe 574 44	1168 45 45 45 ual Plate 650 50	94 36 38 Coun 43 63
Tester Strain WP2 sitive control with metabo Tester Strain WP2	- - -	4NQO Untreated Solvent Compound 2-Anthramine Untreated	2.5 12/1/2013 Dose per plate (ug) 20	Count 1025.33 4133 42.67 Percent S9: Mean Plate Count 552.67 52.33	Deviation 123.70 4.73 4.04 5% Standard Deviation 109.57 9.71 4.16	Ratio Treated / Solvent 13.3	960 43 45 Individe 574 44	1168 45 45 45 ual Plate 650 50	94 36 38 Coun 43 63
Tester Strain WP2 sitive control with metabo	- - -	4NQO Untreated Solvent Compound 2-Anthramine Untreated	2.5 12/1/2013 Dose per plate (ug) 20	Count 1025.33 4133 42.67 Percent S9: Mean Plate Count 552.67 52.33 4167	Deviation 123.70 4.73 4.04 5% Standard Deviation 109.57 9.71 4.16	Ratio Treated / Solvent 13.3	960 43 45 Individe 574 44	1168 45 45 45 ual Plate 650 50	94 36 38 Coun 43 63
Tester Strain WP2 sitive control with metabo Tester Strain WP2	- - -	4NQO Untreated Solvent Compound 2-Anthramine Untreated	2.5 12/1/2013 Dose per plate (ug) 20	Count 1025.33 4133 42.67 Percent S9: Mean Plate Count 552.67 52.33 4167	Deviation 123.70 4.73 4.04 5% Standard Deviation 109.57 9.71 4.16	Ratio Treated / Solvent 13.3	960 43 45 Individe 574 44	1168 45 45 45 ual Plate 650 50	94 36 38 Coun 43 63
Tester Strain WP2 sitive control with metabo Tester Strain WP2	- - -	4NQO Untreated Solvent Compound 2-Anthramine Untreated	2.5 12/1/2013 Dose per plate (ug) 20	Count 1025.33 41.33 42.67 Percent S9: Mean Plate Count 552.67 52.33 41.67 Percent S9:	Deviation 123.70 4.73 4.04 5% Standard Deviation 109.57 9.71 4.16	Ratio Treated / Solvent 13.3 Ratio	960 43 45 Individe 574 44 43	1168 45 45 45 ual Plate 650 50	943 36 38 Coun 43 63 44
Tester Strain WP2 sitive control with metabo Tester Strain WP2 sitive control with metabo		4NQO Untreated Solvent Compound 2-Anthramine Untreated Solvent	2.5 12/1/2013 Dose per plate (ug) 20 12/1/2013	Count 1025.33 4133 42.67 Percent S9: Mean Plate Count 552.67 52.33 4167 Percent S9: Mean Plate	Deviation 123.70 4.73 4.04 5% Standard Deviation 109.57 9.71 4.16 Standard	Ratio Treated / Solvent 13.3 Ratio Treated / Treated /	960 43 45 Individe 574 44 43	1168 45 45 45 45 45 45 650 50 37	943 36 38 Coun 43 63 44
Tester Strain WP2 sitive control with metabo Tester Strain WP2 sitive control with metabo	- - -	4NQO Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound	2.5 12/11/2013 Dose per plate (ug) 20 12/11/2013	Count 1025.33 41.33 42.67 Percent \$9: Mean Plate Count 552.67 52.33 4167 Percent \$9: Mean Plate Count 553.33	Deviation 123.70 4.73 4.04 5% Standard Deviation 109.57 9.71 4.16 Standard Deviation	Ratio Treated / Solvent 13.3 13 Ratio Treated / Solvent Solvent	960 43 45 Individu 574 44 43	1168 45 45 45 45 45 650 50 37	944 36 38 Coun 43 63 48
Tester Strain WP2 sitive control with metabo Tester Strain WP2 sitive control with metabo	- - -	4NQO Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine	2.5 12/11/2013 Dose per plate (ug) 20 12/11/2013	Count 1025.33 4133 42.67 Percent S9: Mean Plate Count 552.67 52.33 4167 Percent S9: Mean Plate Count	Deviation 123.70 4.73 4.04 5% Standard Deviation 109.57 9.71 4.16 Standard Deviation 10%	Ratio Treated / Solvent 13.3 13 Ratio Treated / Solvent 13.6	960 43 45 Individe 574 44 43 Individe 608	1168 45 45 45 45 45 650 50 37	943 33 33 Coun 43 65 44

Table 31: Individual and mean plate counts for Salmonella TA-98 exposed to TS-1 (Specification number 10227-86)

est compound without meta	abolic activation:		11/8/2013						
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Mean Plate Count	Standard Deviation	Ratio Treated / Solvent	Individ	ual Plate	Counts
TA-98	33 (-/+)	TS-1	5.000	29.67	5.03	1.0	25	29	35
1A-96	+	TS-1		30.67		1.0	28		
			2.500		3.79			29 30	35
	-	TS-1	1.250	28.00	2.00	0.9	28		26
		TS-1	0.625	35.00	8.89	1.2	28	45	32
	-	TS-1	0.313	39.33	4.16	1.3	36	44	38
	-	TS-1	0.156	36.33	5.86	1.2	34	32	43
est compound with metabo	lic activation:	1	11/15/2013	Percent S9:	5%	-			
						Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent		ual Plate	
TA-98	+(5%)	TS-1	5.000	55.33	8.50	1.2	65	49	52
	+(5%)	TS-1	2.500	50.00	16.52	1.1	69	39	42
	+(5%)	TS-1	1.250	47.00	11.14	1.1	35	57	49
	+(5%)	TS-1	0.625	45.00	4.24	1.0	42	48	NA
	+(5%)	TS-1	0.313	42.67	13.32	1.0	34	36	58
	+(5%)	TS-1	0.156	38.67	8.74	0.9	46	41	29
	` '								
est compound with metabo	lic activation:		11/8/2013	Percent S9:	10%				
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Counts
TA-98	+(10%)	TS-1	5.000	37.00	8.00	0.9	29	45	37
17-30	+(10%)	TS-1	2.500	33.33	4.51	0.8	38	29	33
	+(10%)	TS-1	1.250	45.00	3.00	1.1	48	42	45
	+(10%)	TS-1	0.625	45.33	5.51	1.1	48	49	39
		TS-1	0.823			1.2	46	49	52
	+(10%)			46.67	5.03				
	+(10%)	TS-1	0.156	45.00	4.00	1.1	49	41	45
	alia Para de Caractera		44/0/0040						ļ.
ositive control without meta	abolic activation	<u> </u>	11/8/2013	i i		5			
				 .		Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent		ual Plate	
TA-98	-	2-Nitrofluorene	3	258.00	12.53	8.7	259	270	245
	-	Untreated		30.33	5.69	1.0	24	35	32
	-	Solvent		29.67	3.51		33	26	30
ositive control with metabo	lic activation:		11/15/2013	Percent S9:	5%				
COMITO COMMITTE MICHINICIADO						Ratio			
ookiivo oo ikioi mkii motabo						Katio			
Common man morals				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Mean Plate Count	Standard Deviation		Individ	ual Plate	Counts
	S9 (-/+) +(5%)	Compound 2-Anthramine	Dose per plate (ug)			Treated /	Individ	ual Plate	Counts 204
Tester Strain				Count	Deviation	Treated / Solvent			-
Tester Strain	+(5%) +(5%)	2-Anthramine Untreated		206.00 53.67	1.73 9.71	Treated / Solvent 4.6	207 43	207 56	204
Tester Strain	+(5%)	2-Anthramine		C o unt 206.00	Deviation 1.73	Treated / Solvent 4.6	207	207	204 62
Tester Strain TA-98	+(5%) +(5%) +(5%)	2-Anthramine Untreated	0.5	206.00 53.67 44.33	1.73 9.71 8.96	Treated / Solvent 4.6	207 43	207 56	204 62
Tester Strain	+(5%) +(5%) +(5%)	2-Anthramine Untreated	0.5	206.00 53.67	1.73 9.71 8.96	Treated / Solvent 4.6 1.2	207 43	207 56	204 62
Tester Strain TA-98	+(5%) +(5%) +(5%)	2-Anthramine Untreated	0.5	Count 206.00 53.67 44.33	1.73 9.71 8.96	Treated / Solvent 4.6 1.2 Ratio	207 43	207 56	204 62
Tester Strain TA-98 cositive control with metabo	+(5%) +(5%) +(5%) +(5%)	2-Anthramine Untreated Solvent	0.5 11/8/2013	Count 206.00 53.67 44.33 Percent S9:	1.73 9.71 8.96 10% Standard	Treated / Solvent 4.6 1.2 Ratio Treated /	207 43 50	207 56 34	204 62 49
Tester Strain TA-98 ositive control with metabo Tester Strain	+(5%) +(5%) +(5%) +(5%) lic activation:	2-Anthramine Untreated Solvent	0.5 1//8/2013 Dose per plate (ug)	Count 206.00 53.67 44.33 Percent S9: Mean Plate Count	173 9.71 8.96 10% Standard Deviation	Treated / Solvent 4.6 12 Ratio Treated / Solvent	207 43 50 Individ	207 56 34	204 62 49
Tester Strain TA-98 cositive control with metabo	+(5%) +(5%) +(5%) +(5%) lic activation: S9 (-/+) +(10%)	2-Anthramine Untreated Solvent Compound 2-Anthramine	0.5 11/8/2013	Count 206.00 53.67 44.33 Percent S9: Mean Plate Count 130.33	173 9.71 8.96 10% Standard Deviation 0.58	Ratio Treated / Solvent 4.6 12 Ratio Treated / Solvent 3.2	207 43 50 Individential	207 56 34 ual Plate 130	204 62 49 Counts
Tester Strain TA-98 ositive control with metabo Tester Strain	+(5%) +(5%) +(5%) +(5%) lic activation: S9 (-/+) +(10%)	2-Anthramine Untreated Solvent Compound 2-Anthramine Untreated	0.5 1//8/2013 Dose per plate (ug)	Count 206.00 53.67 44.33 Percent S9: Mean Plate Count 130.33 47.67	1.73 9.71 8.96 10% Standard Deviation 0.58 7.57	Treated / Solvent 4.6 12 Ratio Treated / Solvent	207 43 50 Individed 130 39	207 56 34 ual Plate 130 51	204 62 49 Counts 131 53
Tester Strain TA-98 ositive control with metabo Tester Strain	+(5%) +(5%) +(5%) +(5%) lic activation: S9 (-/+) +(10%)	2-Anthramine Untreated Solvent Compound 2-Anthramine	0.5 1//8/2013 Dose per plate (ug)	Count 206.00 53.67 44.33 Percent S9: Mean Plate Count 130.33	173 9.71 8.96 10% Standard Deviation 0.58	Ratio Treated / Solvent 4.6 12 Ratio Treated / Solvent 3.2	207 43 50 Individential	207 56 34 ual Plate 130	204 62 49 Counts
Tester Strain TA-98 ositive control with metabo Tester Strain TA-98	+(5%) +(5%) +(5%) +(5%) lic activation: S9 (-/+) +(10%) +(10%)	2-Anthramine Untreated Solvent Compound 2-Anthramine Untreated Solvent	0.5 1//8/2013 Dose per plate (ug)	Count 206.00 53.67 44.33 Percent S9: Mean Plate Count 130.33 47.67 40.33	Deviation 173 9.71 8.96 10% Standard Deviation 0.58 7.57 8.96	Ratio Treated / Solvent 4.6 12 Ratio Treated / Solvent 3.2	207 43 50 Individed 130 39	207 56 34 ual Plate 130 51	204 62 49 Counts 131 53

Table 32: Individual and mean plate counts for Salmonella TA-100 exposed to TS-1 (Specification number 10227-86)

	abolic activation:		10/15/201	3					
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	Caunt
TA-100	39 (-/+)	TS-1	5.000	113.67	18.61	0.9	116	94	13
TA-100	+								
	-	TS-1	2.500	97.00	4.58	0.8	101	92	98
	-	TS-1	1.250	114.33	8.50	0.9	106	123	114
	-	TS-1	0.625	126.00	10.44	1.0	114	131	13
	-	TS-1	0.313	128.33	7.23	1.1	120	132	13
	-	TS-1	0.156	116.67	12.06	1.0	128	118	10
est compound with metabol	ic activation:		10/15/201	Percent S9:	5%				
·						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	Coun
TA-100	+(5%)	TS-1	5.000	111.00	13.00	0.8	126	103	104
I A-100		_							
	+(5%)	TS-1	2.500	110.33	8.50	0.8	102	119	110
	+(5%)	TS-1	1.250	123.33	16.56	0.9	125	139	10
	+(5%)	TS-1	0.625	126.67	7.23	1.0	123	122	13
	+(5%)	TS-1	0.313	115.67	2.52	0.9	118	116	11
	+(5%)	TS-1	0.156	120.67	10.79	0.9	113	116	13
	1 , (
est compound with metabol	ic activation:		10/15/201	Percent S9:	10%				
ot compound minimotabon	10 401114110111	1	10/10/20 1	1	10 70	Ratio			
				M ean Plate	Standard	Treated /			
									_
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent		ial Plate	
TA-100	+(10%)	TS-1	5.000	110.67	8.74	0.9	101	113	11
	+(10%)	TS-1	2.500	108.00	4.36	0.8	110	111	10
	+(10%)	TS-1	1.250	129.33	6.43	1.0	134	122	13
	+(10%)	TS-1	0.625	114.00	12.53	0.9	126	101	11
	+(10%)	TS-1	0.313	114.33	6.81	0.9	112	122	10
	+(10%)	TS-1	0.156	135.33	23.76	1.0	147	151	10
	. (1070)	.0.	0.00	100.00	200			.0.	10
ositive control without meta	abolic activation		10/15/201	2					
DSILIVE COTILIOT WILLIOUT ITTELE	ibolic activation.	1	10/ 10/20 1	, 		Ratio			
				Mean Plate	Standard	Treated /			_
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent		ual Plate	_
TA-100	-	Sodium Azide	3	1433.00	56.31	11.8	1402	1498	139
	-	Untreated		121.33	9.07	1.0	125	128	11
	-	Solvent		121.67	8.96		132	116	11
sitive control with metabol	lic activation:		10/15/201	Percent S9:	5%				
	T	T				Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individu	ual Plate	Coun
TA-100	+(5%)	2-Anthramine	0.5	579.67	17.47	4.4	599	575	_
I A-100			0.0						56
	+(5%)	Untreated		125.33	3.51	1.0	129	122	12
	+(5%)	Solvent		131.67	2.08		131	134	13
sitive control with metabol	ic activation:		10/15/201	Percent S9:	10 %				
JOHN O COMMON MAIN MICHAEL						Ratio			
	I			M ean Plate	Standard	Treated /			
on o como man monago				Count	Deviation	Solvent	Individ	ual Plate	Coun
	S9 (-/+)	Compound	Dose per plate (ug)						
Tester Strain	\$9 (-/+) +(10%)	Compound 2-Anthramine	Dose per plate (ug)		0.71	26	332	NA	33
	+(10%)	2-Anthramine	Dose per plate (ug) 0.5	331.50	0.71	2.6	332	NA 120	33
Tester Strain					0.71 7.77 13.11	2.6 1.1	332 144 132	NA 129 116	33 14 14

Table 33: Individual and mean plate counts for Salmonella TA-1535 exposed to TS-1 (Specification number 10227-86)

Test compound without met	abolic activation:		11/22/2013						
·						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Counts
TA-1535	-	TS-1	5.000	12.67	4.16	1.2	14	16	8
	-	TS-1	2.500	16.00	4.36	1.5	13	14	21
	_	TS-1	1.250	16.00	4.58	1.5	17	20	11
	_	TS-1	0.625	12.67	8.08	1.2	4	14	20
	_	TS-1	0.313	13.00	4.00	1.3	17	9	13
	_	TS-1	0.156	10.33	1.53	1.0	12	10	9
	_	10-1	0.50	10.55	1.00	1.0	L.	Ю	
Test compound with metabo	lic activation:		11/22/2013	Percent S9:	5%				
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Counts
TA-1535	+(5%)	TS-1	5.000	8.33	3.51	0.6	5	12	8
17-833	+(5%)	TS-1	2.500	11.67	1.15	0.8	13	11	11
	+(5%)	TS-1	1.250	11.67	1.15	0.8	13	11	11
	+(5%)	TS-1	0.625	15.67	1.53	1.0	17	16	14
						1.0	22	15	13
	+(5%)	TS-1	0.313	16.67	4.73				_
	+(5%)	TS-1	0.156	14.00	1.73	0.9	13	16	13
Tast as man	lia antivotia av		40/04/0040	Danaant CO.	40.07				
Test compound with metabo	olic activation:	ı	10/24/2013	Percent S9:	10%	D-41-			
						Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent		ual Plate	
TA-1535	+(10%)	TS-1	5.000	13.33	3.21	0.9	12	17	11
	+(10%)	TS-1	2.500	10.00	2.83	0.7	12	NA	8
	+(10%)	TS-1	1.250	14.00	3.61	0.9	10	15	17
	+(10%)	TS-1	0.625	9.67	4.73	0.6	8	6	15
	+(10%)	TS-1	0.313	13.67	5.13	0.9	15	8	18
	+(10%)	TS-1	0.156	12.33	2.52	0.8	10	15	12
Positive control without met	tabolic activation		11/22/2013	1	1				
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent		ual Plate	
TA-1535	-	Sodium Azide	3	564.00	32.19	54.6	560	534	598
	-	Untreated		14.33	5.13	1.4	13	20	10
	-	Solvent		10.33	4.04		14	11	6
Positive control with metabo	olic activation:		11/22/2013	Percent S9:	5%				
						Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individ	ual Plate	Counts
TA-1535	+(5%)	2-Anthramine	0.5	43.67	3.21	2.9	40	46	45
	+(5%)	Untreated		17.67	4.04	1.2	20	20	13
	+(5%)	Solvent		15.00	5.57		20	16	9
Positive control with metabo	olic activation:		10/24/2013	Percent S9:	10%				
						Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individ	ual Plate	Counts
TA-1535	+(10%)	2-Anthramine	0.5	31.67	4.04	2.1	28	36	31
	+(10%)	Untreated		17.00	5.29	1.1	15	13	23
	+(10%)	Solvent		15.33	2.52		18	13	15
	. (.5,3)								
'NA" indicates value was no	t accurate due to	water condensation	on, was not included in mean or	statistical analy	202				
Bold indicates significant d				Statistical allaly					
i u munuatus signiilualit u		ivoin contional p	~ U.UU.						

Table 34: Individual and mean plate counts for Salmonella TA-1537 exposed to TS-1 (Specification number 10227-86)

	bolic activation:		11/1/2013						
						Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	Count
TA-1537	03 (-7+)	TS-1	5.000	15.00	1.73	1.2	16	16	13
TA- D37	-								
		TS-1	2.500	15.33	3.21	1.2	14	19	13
	-	TS-1	1.250	11.33	4.04	0.9	12	7	15
	-	TS-1	0.625	15.00	1.00	1.2	15	14	16
	-	TS-1	0.313	13.00	0.00	1.0	13	13	13
	-	TS-1	0.156	12.67	3.06	1.0	12	16	10
			İ						
est compound with metaboli	c activation:		11/1/2013	Percent S9:	5%				
•						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	Count
TA-1537	+(5%)	TS-1	5.000	16.33	2.52	0.7			19
IA- D37							14	16	
	+(5%)	TS-1	2.500	17.33	3.51	0.8	14	17	21
	+(5%)	TS-1	1.250	17.67	4.62	0.8	23	15	15
	+(5%)	TS-1	0.625	20.00	4.36	0.9	17	18	25
	+(5%)	TS-1	0.313	23.00	3.61	1.0	19	26	24
	+(5%)	TS-1	0.156	16.33	5.51	0.7	11	16	22
est compound with metaboli	c activation:		11/1/2013	Percent S9:	10%				
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dana man mlata (vil.)	Count	Deviation	Solvent	1	ual Plate	C
			Dose per plate (uL)						
TA-1537	+(10%)	TS-1	5.000	20.67	2.52	1.1	21	18	23
	+(10%)	TS-1	2.500	15.67	3.51	0.9	19	16	12
	+(10%)	TS-1	1.250	17.00	3.46	0.9	15	21	15
	+(10%)	TS-1	0.625	22.67	4.51	1.2	18	23	27
	+(10%)	TS-1	0.313	19.33	3.06	1.1	16	22	20
	+(10%)	TS-1	0.156	15.33	2.52	0.8	13	15	18
	` ′								
ositive control without meta	holic activation		11/1/2013						
ookii oookii oo ka aa aa aa aa aa aa aa aa aa aa aa aa			17720.0			Ratio			
				M ean Plate	Standard	Treated /			
T 1 01 1 -	00 (/)		D 1-(- ()						.
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent		ual Plate	
TA-1537	-	9-Amino acridine	100	929.00	126.01	71.5	1056	927	804
	-	Untreated		17.33	4.62	1.3	12	20	20
							11	14	14
	-	Solvent		13.00	1.73				
	-	Solvent		13.00	1.73				
Positive control with metabol		Solvent	11/1/2013	13.00 Percent S9:					
Positive control with metabol		Solvent	11/1/2013			Ratio	"		
ositive control with metabol		Solvent	11/1/2013	Percent S9:	5%	Ratio	"		
	ic activation:			Percent S9:	5% Standard	Treated /			
Tester Strain	ic activation:	Compound	Dose per plate (ug)	Mean Plate	5% Standard Deviation	Treated / Solvent	Individ	ual Plate	Counts
	\$9 (-/+) +(5%)	Compound 2-Anthramine		Mean Plate Count 52.67	5% Standard Deviation 2.52	Treated / Solvent 2.3	Individ	ual Plate 50	Counts 53
Tester Strain	\$9 (-/+) +(5%) +(5%)	Compound 2-Anthramine Untreated	Dose per plate (ug)	Mean Plate Count 52.67 17.67	5% Standard Deviation 2.52 2.52	Treated / Solvent	Individ: 55 20	Jal Plate 50 18	Counts 53 15
Tester Strain	\$9 (-/+) +(5%)	Compound 2-Anthramine	Dose per plate (ug)	Mean Plate Count 52.67	5% Standard Deviation 2.52	Treated / Solvent 2.3	Individ	ual Plate 50	Counts 53
Tester Strain TA-1537	\$9 (-/+) +(5%) +(5%) +(5%)	Compound 2-Anthramine Untreated	Dose per plate (ug)	Mean Plate Count 52.67 17.67 22.67	5% Standard Deviation 2.52 2.52 3.21	Treated / Solvent 2.3	Individ: 55 20	Jal Plate 50 18	Counts 53 15
Tester Strain TA-1537	\$9 (-/+) +(5%) +(5%) +(5%)	Compound 2-Anthramine Untreated	Dose per plate (ug)	Mean Plate Count 52.67 17.67	5% Standard Deviation 2.52 2.52 3.21	Treated / Solvent 2.3 0.8	Individ: 55 20	Jal Plate 50 18	Counts 53 15
Tester Strain	\$9 (-/+) +(5%) +(5%) +(5%)	Compound 2-Anthramine Untreated	Dose per plate (ug)	Mean Plate Count 52.67 17.67 22.67	5% Standard Deviation 2.52 2.52 3.21	Treated / Solvent 2.3	Individ: 55 20	Jal Plate 50 18	Counts 53 15
Tester Strain TA-1537	\$9 (-/+) +(5%) +(5%) +(5%)	Compound 2-Anthramine Untreated	Dose per plate (ug)	Mean Plate Count 52.67 17.67 22.67	5% Standard Deviation 2.52 2.52 3.21	Treated / Solvent 2.3 0.8	Individ: 55 20	Jal Plate 50 18	Counts 53 15
Tester Strain TA-1537 Positive control with metabol	\$9 (-/+) +(5%) +(5%) +(5%)	Compound 2-Anthramine Untreated Solvent	Dose per plate (ug) 3 11/1/2013	Mean Plate Count 52.67 17.67 22.67 Percent S9:	Standard Deviation 2.52 2.52 3.21 10% Standard	Treated / Solvent 2.3 0.8 Ratio Treated /	Individ: 55 20 19	ual Plate 50 18 24	Counts 53 15 25
Tester Strain TA-f537 Positive control with metabol Tester Strain	\$9 (-/+) + (5%) + (5%) + (5%) ic activation:	Compound 2-Anthramine Untreated Solvent Compound	Dose per plate (ug) 3 11/1/2013 Dose per plate (ug)	Mean Plate Count 52.67 17.67 22.67 Percent S9: Mean Plate Count	Standard Deviation 2.52 2.52 3.21 10% Standard Deviation	Treated / Solvent 2.3 0.8 Ratio Treated / Solvent	Individe 55 20 19	Jal Plate 50 18 24	Counts 53 15 25
Tester Strain TA-f537 Positive control with metabol	\$9 (-/+) + (5%) + (5%) + (5%) ic activation: \$9 (-/+) + (10%)	Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine	Dose per plate (ug) 3 11/1/2013	Mean Plate Count 52.67 17.67 22.67 Percent S9: Mean Plate Count 33.67	Standard Deviation 2.52 2.52 3.21 10% Standard Deviation 2.31	Treated / Solvent 2.3 0.8 Ratio Treated / Solvent 18	Individe 55 20 19 Individe 35	18 24 24 21 Plate 31	Counts 53 15 25 Counts 35
Tester Strain TA-1537 Positive control with metabol Tester Strain	\$9 (-/+) + (5%) + (5%) + (5%) ic activation:	Compound 2-Anthramine Untreated Solvent Compound	Dose per plate (ug) 3 11/1/2013 Dose per plate (ug)	Mean Plate Count 52.67 17.67 22.67 Percent S9: Mean Plate Count	Standard Deviation 2.52 2.52 3.21 10% Standard Deviation	Treated / Solvent 2.3 0.8 Ratio Treated / Solvent	Individe 55 20 19	Jal Plate 50 18 24	Counts 53 15 25

Table 35: Individual and mean plate counts for E. coli WP2 exposed to TS-1 (Specification number 10227-86)

est compound without met	abolic activation:		12/11/201	3					
·				M ean Plate	Standard	Ratio Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	Count
WP2	33 (-/+)	TS-1	5.000	39.67	7.02	0.9	39	33	47
VVI Z	 	TS-1	2.500	47.00	13.45	1.1	36	62	43
	-	TS-1	1.250	35.67	4.16	0.8	31	37	39
	-	TS-1	0.625	45.67	1.53	1.1	47	44	46
	-	TS-1	0.813	39.33	3.06	0.9	40	36	40
	-								_
	-	TS-1	0.156	43.33	4.04	1.0	41	48	41
est compound with metabo	olic activation:		12/11/201	Percent S9:	5%				
·						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	Count
WP2	+(5%)	TS-1	5.000	49.67	4.51	1.2	50	54	45
	+(5%)	TS-1	2.500	42.00	5.20	1.0	39	48	39
	+(5%)	TS-1	1,250	60.00	1.73	1.4	61	61	58
	+(5%)	TS-1	0.625	58.67	3.21	1.4	61	55	60
	+(5%)	TS-1	0.813	58.00	7.21	1.4	52	66	56
	+(5%)	TS-1	0.156	45.67	6.35	1.1	42	42	53
est compound with metabo	olic activation:		12/11/201	Percent S9:	10%				
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent		ual Plate	
WP2	+(10%)	TS-1	5.000	43.33	6.03	1.1	37	49	44
	+(10%)	TS-1	2.500	42.33	2.52	1.1	45	40	42
	+(10%)	TS-1	1.250	56.00	11.53	1.4	65	60	43
	+(10%)	TS-1	0.625	36.00	21.63	0.9	30	18	60
	+(10%)	TS-1	0.313	47.33	4.93	1.2	53	45	44
	+(10%)	TS-1	0.156	37.67	8.08	1.0	39	29	45
	tabalia astirotia u		12/11/201						
ositive control without met	labolic activation		IZ/ IV20 k	1		Ratio			
				M ean Plate	Standard	Treated /			
Tastas Strain	60 (()		Dana man mlata ()			Solvent	I madical ala	.al Diata	C =
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation			ual Plate	_
WP2	-	4NQO	2.5	1025.33	123.70	24.0	960	1168	948
	-	Untreated		41.33	4.73	1.0	43	45	36
	-	Solvent		42.67	4.04		45	45	38
ositive control with metabo	alic activation:		12/11/201	Percent S9:	5%				
2 2 O OO OT WILL IT IT OLD CO	activation.		L, 1720 k			Ratio			
	İ			Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individu	ual Plate	Court
WP2		2-Anthramine	20				574		434
VVPZ	+(5%)		20	552.67	109.57 9.71	13.3		650	_
	+(5%)	Untreated		52.33	•	1.3	44	50	63
	+(5%)	Solvent	· ·	41.67	4.16		43	37	45
ositive control with metabo	alic activation:		12/11/201	Percent S9:	10%				
COMPONENTIAL WILLIAM	, dottvation.	1		. crosiii og.		Ratio			
	İ			M ean Plate	Standard	Treated /			
Tantan Ctual:	60 (/)	اا	Dana man mlata (::::)				I madical de	and Dilace	C =
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent		ual Plate	_
WP2	+(10%)	2-Anthramine	20	533.33	96.77	13.6	608	424	568
	+(10%)	Untreated		53.33	8.39	1.4	49	48	63
···-									
	+(10%)	Solvent		39.33	4.04		44	37	37

Table 36: Individual and mean plate counts for Salmonella TA-98 exposed to Gevo 7695 with JP8 additives (POSF 7699)

	bolic activation:		11/8/2013						
				M ean Plate	Standard	Ratio Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent		ual Plate	Count
TA-98	-	Gevo 7699	5.000	34.00	6.00	1.1	28	34	40
	-	Gevo 7699	2.500	27.33	5.13	0.9	23	26	33
	-	Gevo 7699	1.250	29.00	8.19	1.0	36	31	20
	-	Gevo 7699	0.625	32.33	3.06	1.1	29	33	35
	-	Gevo 7699	0.313	27.00	3.61	0.9	30	23	28
	-	Gevo 7699	0.156	24.67	2.31	0.8	22	26	26
st compound with metaboli	c activation:		11/15/2013	Percent S9:	5%				
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Coun
TA-98	+(5%)	Gevo 7699	5.000	49.67	13.87	1.1	65	46	38
	+(5%)	Gevo 7699	2.500	37.33	4.73	0.8	39	32	4
	+(5%)	Gevo 7699	1.250	42.00	3.00	0.9	42	39	45
	+(5%)	Gevo 7699	0.625	38.67	2.89	0.9	42	37	3
	+(5%)	Gevo 7699	0.313	41.67	9.29	0.9	48	46	3
	+(5%)	Gevo 7699	0.156	39.33	1.53	0.9	39	41	38
est compound with metaboli	c activation:		11/8/2013	Percent S9:	10%				
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Count
TA-98	+(10%)	Gevo 7699	5.000	45.33	2.31	1.1	44	44	48
	+(10%)	Gevo 7699	2.500	39.33	5.51	1.0	39	34	45
	+(10%)	Gevo 7699	1.250	50.00	11.79	1.2	37	53	60
	+(10%)	Gevo 7699	0.625	36.33	6.51	0.9	43	36	30
	+(10%)	Gevo 7699	0.313	45.33	4.73	1.1	47	40	49
	+(10%)	Gevo 7699	0.156	47.00	9.17	1.2	37	55	49
sitive control without metal	bolic activation		11/8/2013						
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individ	ual Plate	Coun
TA-98	-	2-Nitrofluorene	3	258.00	12.53	8.7	259	270	24
		1							32
	-	Untreated		30.33	5.69	1.0	24	35	
	-	Untreated Solvent		30.33 29.67	5.69 3.51	1.0	24 33	35 26	
		Solvent		30.33 29.67	5.69 3.51	1.0	33	26	
sitive control with metaboli	-		11/15/2013	29.67	3.51	1.0			
ositive control with metaboli	-		11/15/2013		3.51	1.0			30
sitive control with metaboli	-		11/15/2013	29.67 Percent S9:	3.51 5%	Ratio			
	ic activation:	Solvent		29.67 Percent S9: Mean Plate	3.51 5% Standard	Ratio Treated /	33	26	30
ositive control with metaboli Tester Strain TA-98	-		11/15/2013 Dose per plate (ug) 0.5	29.67 Percent S9:	3.51 5%	Ratio	33		Coun
Tester Strain	ic activation:	Compound	Dose per plate (ug)	29.67 Percent S9: Mean Plate Count	3.51 5% Standard Deviation	Ratio Treated / Solvent	33	26 Jal Plate	County 20
Tester Strain	- ic activation: \$9 (-/+) +(5%) +(5%)	Compound 2-Anthramine	Dose per plate (ug)	29.67 Percent S9: Mean Plate Count 206.00	3.51 5% Standard Deviation 173	Ratio Treated / Solvent 4.6	Individe 207	26 ual Plate 207	30
Tester Strain	- ic activation: S9 (-/+) +(5%)	Compound 2-Anthramine Untreated	Dose per plate (ug)	29.67 Percent S9: Mean Plate Count 206.00 53.67	3.51 5% Standard Deviation 173 9.71	Ratio Treated / Solvent 4.6	33 Individe 207 43	26 Jal Plate 207 56	30 Count 20 62
Tester Strain	- ic activation: \$9 (-/+) + (5%) + (5%) + (5%)	Compound 2-Anthramine Untreated	Dose per plate (ug) 0.5	29.67 Percent S9: Mean Plate Count 206.00 53.67	3.51 5% Standard Deviation 1.73 9.71 8.96	Ratio Treated / Solvent 4.6	33 Individe 207 43	26 Jal Plate 207 56	30 Count 20 62
Tester Strain TA-98	- ic activation: \$9 (-/+) + (5%) + (5%) + (5%)	Compound 2-Anthramine Untreated	Dose per plate (ug) 0.5	29.67 Percent S9: Mean Plate Count 206.00 53.67 44.33	3.51 5% Standard Deviation 1.73 9.71 8.96	Ratio Treated / Solvent 4.6	33 Individe 207 43	26 Jal Plate 207 56	30 Count 20 62
Tester Strain TA-98	- ic activation: \$9 (-/+) + (5%) + (5%) + (5%)	Compound 2-Anthramine Untreated	Dose per plate (ug) 0.5	29.67 Percent S9: Mean Plate Count 206.00 53.67 44.33	3.51 5% Standard Deviation 1.73 9.71 8.96	Ratio Treated / Solvent 4.6 1.2	33 Individe 207 43	26 Jal Plate 207 56	20 62
Tester Strain TA-98	- ic activation: \$9 (-/+) + (5%) + (5%) + (5%)	Compound 2-Anthramine Untreated	Dose per plate (ug) 0.5	29.67 Mean Plate Count 206.00 53.67 44.33 Percent S9:	3.51 5% Standard Deviation 173 9.71 8.96	Ratio Treated / Solvent 4.6 12	33 Individu 207 43 50	26 Jal Plate 207 56	200 62 48
Tester Strain TA-98 District control with metaboli	\$9 (-/+) +(5%) +(5%) +(5%) ic activation:	Compound 2-Anthramine Untreated Solvent	Dose per plate (ug) 0.5 1/8/2013	29.67 Percent S9: Mean Plate Count 206.00 53.67 44.33 Percent S9: Mean Plate	3.51 5% Standard Deviation 173 9.71 8.96 10% Standard	Ratio Treated / Solvent 4.6 12	33 Individu 207 43 50	26 ual Plate 207 56 34	200 62 48
Tester Strain TA-98 positive control with metaboli Tester Strain	S9 (-/+) +(5%) +(5%) +(5%) ic activation: S9 (-/+) +(10%)	Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine	Dose per plate (ug) 0.5 11/8/2013 Dose per plate (ug)	29.67 Percent S9: Mean Plate Count 206.00 53.67 44.33 Percent S9: Mean Plate Count 130.33	3.51 5% Standard Deviation 173 9.71 8.96 10% Standard Deviation 0.58	Ratio Treated / Solvent 4.6 12 Ratio Treated / Solvent 3.2	33 Individe 207 43 50 Individe	26 Jal Plate 207 56 34 Jal Plate 130	20 62 49
Tester Strain TA-98 ositive control with metaboli	S9 (-/+) +(5%) +(5%) +(5%) +(5%) se activation:	Compound 2-Anthramine Untreated Solvent Compound	Dose per plate (ug) 0.5 11/8/2013 Dose per plate (ug)	Percent S9: Mean Plate Count 206.00 53.67 44.33 Percent S9: Mean Plate Count	3.51 Standard Deviation 173 9.71 8.96 10% Standard Deviation	Ratio Treated / Solvent 4.6 12 Ratio Treated / Solvent	33 Individi 207 43 50	26 Jal Plate 207 56 34 Jal Plate	Coun 200 62 49 Coun

Table 37: Individual and mean plate counts for Salmonella TA-100 exposed to Gevo 7695 with JP8 additives (POSF 7699)

Test compound without met	tabolic activation		10/15/2013	3					
root compound mane at mo			10, 10, 20 %			Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Counts
TA-100		Gevo 7699	5.000	109.67	8.74	0.9	112	117	100
	-	Gevo 7699	2.500	120.67	8.62	1.0	130	113	119
	-	Gevo 7699	1.250	109.33	8.08	0.9	118	108	102
	_	Gevo 7699	0.625	117.00	11.00	1.0	117	128	106
	-	Gevo 7699	0.313	133.00	10.58	1.1	137	121	141
	-	Gevo 7699	0.156	138.00	10.58	1.1	134	130	150
		Gevo 7033	0.50	100.00	i0.50	1.1			
Test compound with metabo	olic activation:		10/15/2013	Percent S9:	5%				
•						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Counts
TA-100	+(5%)	Gevo 7699	5.000	97.00	12.73	0.7	88	NA	106
	+(5%)	Gevo 7699	2.500	132.33	7.57	1.0	141	129	127
	+(5%)	Gevo 7699	1.250	125.50	10.61	1.0	118	133	NA
	+(5%)	Gevo 7699	0.625	126.67	15.01	1.0	142	112	126
	+(5%)	Gevo 7699	0.313	118.33	10.02	0.9	126	107	122
	+(5%)	Gevo 7699	0.156	131.50	0.71	1.0	132	131	NA
	1 (070)	5010 1000	0.80	N 1.00	0.71	1.0		101	14/1
Fest compound with metabo	olic activation:		10/15/2019	Percent S9:	10%				
	301174110111			1	1	Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Counts
TA-100	+(10%)	Gevo 7699	5.000	119.67	6.43	0.9	117	115	127
171 100	+(10%)	Gevo 7699	2.500	133.33	22.37	1.0	118	123	159
	+(10%)	Gevo 7699	1.250	127.00	11.27	1.0	120	140	121
	+(10%)	Gevo 7699	0.625	129.00	10.39	1.0	135	135	117
	+(10%)	Gevo 7699	0.313	124.50	0.71	1.0	124	125	NA
	+(10%)	Gevo 7699	0.156	125.67	3.51	1.0	126	129	122
	T(1070)	Gev0 7099	0.50	12.07	3.31	1.0	120	123	122
Positive control without me	taholic activation		10/15/2013	3					
			10, 10, 20 10	T		Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individ	ual Plate	Counts
TA-100	- 33 (-/+)	Sodium Azide	3	1433.00	56.31	11.8	1402	1498	1399
17-100	 	Untreated	3	121.33	9.07	1.0	125	128	111
	 	Solvent		121.67	8.96	1.0	132	116	117
		Solveni		12 1.07	0.90		102	110	11/
Positive control with metabo	alic activation:		10/15/2015	Percent S9:	5%				
COMPO CONTROL WITH METADI	J dottvation.	1	10/10/20 6	. Crosii Os.		Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individ	ual Plate	Counts
TA-100	+(5%)	2-Anthramine	0.5	579.67	17.47	4.4	599	575	565
1 A-100	+(5%)	Untreated	0.5	125.33	3.51	1.0	129	122	125
	+(5%)	Solvent		131.67	2.08	I.U	131	134	130
	T (370)	COIVELL		10.107	2.00		1 101	N4	00
Positive control with metabo	alic activation:		10/15/2015	Percent S9:	10%				
John John Mill Hetabl	J.I.J GOLIVACION.		10/10/2010	1 3100111 03.		Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individ	ual Plate	Counte
TA-100	+(10%)	2-Anthramine	0.5	331.50	0.71	2.6	332	NA NA	331
1 A-100	+(10%)	Untreated	0.5	137.67	7.77	1.1	332 144	129	140
	+(10%)	Solvent		137.67	13.11	LI	132	116	140
	+(IU70)	Solveni		150.00	Б. II		l) l)Z	110	142
NIA " indicator	t accurate due to	woter ee adama : ''	n waa natinakidadia aasaa	r atatiatical as - !	200				-
			on, was not included in mean o	ı statistical analy	5 6 5.				-
3 o ld indicates significant of	iii rerence nom S0	iveni control at p	< U.UJ.						

Table 38: Individual and mean plate counts for Salmonella TA-1535 exposed to Gevo 7695 with JP8 additives (POSF 7699)

compound without met	abolic activation:		10/24/2013	3					
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	M ean Plate Count	Standard Deviation	Ratio Treated / Solvent	Individ	ual Plate	Coun
TA-1535	-	Gevo 7699	5.000	10.00	5.29	0.8	14	4	1
	-	Gevo 7699	2.500	11.00	1.73	0.9	10	10	1
	-	Gevo 7699	1.250	11.67	1.53	1.0	12	13	1
	-	Gevo 7699	0.625	8.33	2.52	0.7	6	8	1
	-	Gevo 7699	0.313	8.67	1.53	0.7	10	7	
	-	Gevo 7699	0.156	13.67	4.93	1.1	8	16	1
compound with metabo	olic activation:	T 1	10/24/2013	Percent S9:	5%	Ratio	ı		
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Mean Plate Count	Standard Deviation	Treated / Solvent	Individ	ual Plate	Coun
TA-1535	+(5%)	Gevo 7699	5.000	9.00	1.00	0.6	9	8	1
	+(5%)	Gevo 7699	2.500	9.00	4.36	0.6	4	12	1
	+(5%)	Gevo 7699	1.250	14.33	4.93	1.0	12	20	1
	+(5%)	Gevo 7699	0.625	14.00	5.29	1.0	20	10	1
	+(5%)	Gevo 7699	0.313	9.00	2.65	0.6	11	10	
	+(5%)	Gevo 7699	0.156	9.33	6.51	0.7	16	9	
and the second s	. Para a Cara Cara		40/04/00#		400/				
compound with metabo	olic activation:		10/24/201	Percent S9:	10%	Ratio			
				M ean Plate	Standard	Treated /			_
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent		ual Plate	
TA-1535	+(10%)	Gevo 7699	5.000	10.33	4.04	0.7	6	14	<u> </u>
	+(10%)	Gevo 7699	2.500	9.67	0.58	0.6	10	10	
	+(10%)	Gevo 7699	1.250	17.33	2.52	1.1	17	15	2
	+(10%)	Gevo 7699	0.625	13.67	8.33	0.9	23	7	
	+(10%)	Gevo 7699	0.313	13.00	4.00	0.8	9	17	1
	+(10%)	Gevo 7699	0.156	13.00	4.58	0.8	12	9	1
tive control without me	tabolic activation:		10/24/2013	3					
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individ	ual Plate	Coun
TA-1535	-	Sodium Azide	3	445.33	25.03	37.1	444	421	4
	-	Untreated		8.00	2.65	0.7	11	7	-
	-	Solvent		12.00	2.65		15	10	1
tive control with metabo	alia antivation:		40/24/201	Boroont CO.	E 0/				
tive control with metabo	olic activation:		10/24/201	Percent S9:	5%	Patio	Π		
tive control with metabo	olic activation:		10/24/201			Ratio			
		Compound		M ean Plate	Standard	Treated /	Individ	ual Blata	C a
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	M ean Plate Count	Standard Deviation	Treated / Solvent		ual Plate	
	S9 (-/+) +(5%)	2-Anthramine		Mean Plate Count 30.67	Standard Deviation 5.13	Treated / Solvent 2.1	35	32	2
Tester Strain	\$9 (-/+) +(5%) +(5%)	2-Anthramine Untreated	Dose per plate (ug)	Mean Plate Count 30.67 12.00	Standard Deviation 5.13 3.00	Treated / Solvent	35 12	32 15	2
Tester Strain	S9 (-/+) +(5%)	2-Anthramine	Dose per plate (ug)	Mean Plate Count 30.67	Standard Deviation 5.13	Treated / Solvent 2.1	35	32	2
Tester Strain	\$9 (-/+) +(5%) +(5%) +(5%)	2-Anthramine Untreated	Dose per plate (ug) 0.5	Mean Plate Count 30.67 12.00	Standard Deviation 5.13 3.00 5.13	Treated / Solvent 2.1 0.8	35 12	32 15	2
Tester Strain TA-1535	\$9 (-/+) +(5%) +(5%) +(5%)	2-Anthramine Untreated	Dose per plate (ug) 0.5	M ean Plate C o unt 30.67 12.00 14.33	Standard Deviation 5.13 3.00 5.13	Treated / Solvent 2.1	35 12	32 15	2 2 2
Tester Strain TA-1535	\$9 (-/+) +(5%) +(5%) +(5%)	2-Anthramine Untreated	Dose per plate (ug) 0.5	M ean Plate C o unt 30.67 12.00 14.33	Standard Deviation 5.13 3.00 5.13	Treated / Solvent 2.1 0.8	35 12	32 15	2
Tester Strain TA-1535	\$9 (-/+) +(5%) +(5%) +(5%)	2-Anthramine Untreated	Dose per plate (ug) 0.5	M ean Plate Count 30.67 12.00 14.33 3 Percent S9:	Standard <u>Deviation</u> 5.13 3.00 5.13 10%	Treated / Solvent 2.1 0.8	35 12 10	32 15	2
Tester Strain TA-1535 tive control with metabo	\$9 (-/+) +(5%) +(5%) +(5%) +(5%)	2-Anthramine Untreated Solvent	0.5 0.5 10/24/201	Mean Plate Count 30.67 12.00 14.33 Percent S9:	Standard Deviation 5.13 3.00 5.13 10% Standard	Treated / Solvent 2.1 0.8 Ratio Treated /	35 12 10	32 15 13	2 2 Cour
Tester Strain TA-1535 tive control with metabo	\$9 (-/+) +(5%) +(5%) +(5%) -(5%) Dilic activation:	2-Anthramine Untreated Solvent	Dose per plate (ug) 0.5 10/24/201	Mean Plate Count 30.67 12.00 14.33 Percent S9: Mean Plate Count	Standard Deviation 5.13 3.00 5.13 10% Standard Deviation	Ratio Treated / Solvent 2.1 0.8	35 12 10 Individu	32 15 13	2 2 2 C o ur
Tester Strain TA-1535 tive control with metabo	\$9 (-/+) +(5%) +(5%) +(5%) +(5%) blic activation: \$9 (-/+) +(10%)	2-Anthramine Untreated Solvent Compound 2-Anthramine	Dose per plate (ug) 0.5 10/24/201	Mean Plate Count 30.67 12.00 14.33 Percent S9: Mean Plate Count 31.67	Standard Deviation 5.13 3.00 5.13 10% Standard Deviation 4.04	Treated / Solvent 2.1 0.8 Ratio Treated / Solvent 2.1	35 12 10 Individu 28	32 15 13 ual Plate 36	2

Table 39: Individual and mean plate counts for Salmonella TA-1537 exposed to Gevo 7695 with JP8 additives (POSF 7699)

st compound without met	abolic activation:		11/1/2013						
						Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Coun
TA-1537	-	Gevo 7699	5.000	13.67	2.08	1.1	12	16	13
	-	Gevo 7699	2.500	16.33	3.51	1.3	13	20	16
	-	Gevo 7699	1.250	13.67	4.51	1.1	9	14	1
	-	Gevo 7699	0.625	16.33	2.08	1.3	14	18	1
	-	Gevo 7699	0.313	15.00	2.00	1.2	17	15	1
	-	Gevo 7699	0.156	16.33	3.21	1.3	20	15	1
		00.0.000			¥				
st compound with metabo	lic activation:		11/1/2013	Percent S9:	5%				
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	Coun
TA-1537	+(5%)	Gevo 7699	5.000	20.00	9.54	0.9	21	10	2
1A-037	+(5%)	Gevo 7699			1.15	0.8	16	18	_
			2.500	17.33					2
	+(5%)	Gevo 7699	1.250	19.00	4.58	0.8	18	15	
	+(5%)	Gevo 7699	0.625	20.67	2.08	0.9	23	20	1
	+(5%)	Gevo 7699	0.313	23.00	2.65	1.0	21	22	2
	+(5%)	Gevo 7699	0.156	20.00	2.83	0.9	NA	22	1
st compound with metabo	lic activation:		11/1/2013	Percent S9:	10%				
						Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Coun
TA-1537	+(10%)	Gevo 7699	5.000	24.67	10.97	1.3	37	21	1
	+(10%)	Gevo 7699	2.500	16.33	6.66	0.9	22	9	1
	+(10%)	Gevo 7699	1.250	16.50	9.19	0.9	10	23	N
	+(10%)	Gevo 7699	0.625	15.67	4.04	0.9	20	15	1
	+(10%)	Gevo 7699	0.313	26.67	3.21	1.5	29	23	2
	+(10%)	Gevo 7699	0.156	16.00	4.58	0.9	21	15	1
	1 (1574)	00101000		10.00					
sitive control without met	abolic activation		11/1/2013						
okiro control mano de mot	do no do nacion		111200			Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individu	ual Plate	Caun
TA-1537	- 33 (-7+)	9-Amino acridine	100	929.00	126.01	71.5	1056	927	80
TA- 037	-	Untreated	100		4.62	1.3			2
	-			17.33		1.3	12	20 14	1
	-	Solvent		13.00	1.73		11	14	1
			WW00 #						
sitive control with metabo	ilic activation:		11/1/2013	Percent S9:	5%	B			
				l		Ratio	1		
	1			Mean Plate	Standard	Treated /			_
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent		ual Plate	
TA-1537	+(5%)	2-Anthramine	3	52.67	2.52	2.3	55	50	5
	+(5%)	Untreated		17.67	2.52	0.8	20	18	1
	+(5%)	Solvent		22.67	3.21		19	24	2
sitive control with metabo	lic activation:		11/1/2013	Percent S9:	10%				
						Ratio			
	1			M ean Plate	Standard	Treated /	1		
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individ	ual Plate	Cour
TA-1537	+(10%)	2-Anthramine	3	33.67	2.31	1.8	35	31	3
	+(10%)	Untreated		26.67	5.03	1.5	32	22	2
	+(10%)	Solvent		18.33	2.08		16	20	1
	1 (10/0)	557VOIR		10.00	2.00		~		<u> </u>

Table 40: Individual and mean plate counts for *E. coli* WP2 exposed to Gevo 7695 with JP8 additives (POSF 7699)

	abolic activation:		11/1/2013	1					
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Counts
WP2		Gevo 7699	5.000	38.67	1.53	0.9	37	39	40
	-	Gevo 7699	2.500	41.33	6.03	1.0	47	42	35
	-	Gevo 7699	1.250	39.00	5.57	0.9	38	34	45
	-	Gevo 7699	0.625	41.00	3.61	1.0	38	40	45
	_	Gevo 7699	0.313	35.67	4.93	0.8	30	38	39
	_	Gevo 7699	0.156	33.33	8.14	0.8	24	39	37
		00101000	0.100	00.00	0	0.0			- 0.
est compound with metabol	lic activation:		11/1/2013	Percent S9:	5%				
est compound with metabor	donvation.		17 720 8	l crocm os.	0 /0	Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	Counts
WP2	+(5%)	Gevo 7699	5.000	52.33	5.03	1.3	47	57	53
V V I - Z	+(5%)	Gevo 7699	2.500	49.33	8.74	1.2	42	59	47
		Gevo 7699	1.250						49
	+(5%)			54.00	5.57	1.3	53	60	
	+(5%)	Gevo 7699	0.625	50.00	13.00	1.2	50	37	63
	+(5%)	Gevo 7699	0.313	46.33	4.93	1.1	52	44	43
	+(5%)	Gevo 7699	0.156	49.33	10.26	1.2	38	52	58
Test compound with metabol	ic activation:		11/1/2013	Percent S9:	10 %		1		
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Counts
WP2	+(10%)	Gevo 7699	5.000	51.33	13.32	1.3	58	60	36
	+(10%)	Gevo 7699	2.500	41.00	4.58	1.0	42	45	36
	+(10%)	Gevo 7699	1.250	52.00	8.72	1.3	56	58	42
	+(10%)	Gevo 7699	0.625	49.67	10.02	1.3	40	60	49
	+(10%)	Gevo 7699	0.313	48.67	4.16	1.2	50	44	52
	+(10%)	Gevo 7699	0.156	46.33	0.58	1.2	46	46	47
Positive control without meta	abolic activation	:	11/1/2013						
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individ	ual Plate	Counts
Tester Strain WP2	S9 (-/+)	Compound 4NQO	Dose per plate (ug) 2.5			Solvent 24.0	Individ	ual Plate 1168	Counts 948
	S9 (-/+) -			Count	Deviation 123.70 4.73				
	-	4NQO Untreated		Count 1025.33 41.33	123.70 4.73	24.0	960 43	1168 45	948 36
	-	4NQO		Count 1025.33	123.70	24.0	960	1168	948
WP2	-	4NQO Untreated	2.5	Count 1025.33 4133 42.67	123.70 4.73 4.04	24.0	960 43	1168 45	948 36
	-	4NQO Untreated	2.5	Count 1025.33 41.33	123.70 4.73 4.04	24.0 10	960 43	1168 45	948 36
WP2	-	4NQO Untreated	2.5	Count 1025.33 41.33 42.67 Percent S9:	123.70 4.73 4.04 5%	24.0 10 Ratio	960 43	1168 45	948 36
WP2 Positive control with metabol	lic activation:	4NQO Untreated Solvent	2.5	Count 1025.33 41.33 42.67 Percent S9:	123.70 4.73 4.04 5% Standard	24.0 1.0 Ratio	960 43 45	1168 45 45	948 36 38
WP2 Positive control with metabol Tester Strain	lic activation:	4NQO Untreated Solvent	2.5 WV2013 Dose per plate (ug)	Count 1025.33 41.33 42.67 Percent S9: Mean Plate Count	123.70 4.73 4.04 5% Standard Deviation	24.0 10 Ratio Treated / Solvent	960 43 45	1168 45 45 45	948 36 38 Counts
WP2 Positive control with metabol		4NQO Untreated Solvent Compound 2-Anthramine	2.5	Count 1025.33 41.33 42.67 Percent S9: Mean Plate Count 552.67	123.70 4.73 4.04 5% Standard Deviation 109.57	24.0 10 Ratio Treated / Solvent	960 43 45 Individe 574	1168 45 45 45 ual Plate 650	948 36 38 Counts
WP2 Positive control with metabol Tester Strain	S9 (-/+) +(5%)	4NQO Untreated Solvent Compound 2-Anthramine Untreated	2.5 WV2013 Dose per plate (ug)	Count 1025.33 4133 42.67 Percent S9: Mean Plate Count 552.67 52.33	123.70 4.73 4.04 5% Standard Deviation 109.57 9.71	24.0 10 Ratio Treated / Solvent	960 43 45 Individe 574 44	1168 45 45 45 ual Plate 650 50	948 36 38 Counts 434 63
WP2 Positive control with metabol Tester Strain		4NQO Untreated Solvent Compound 2-Anthramine	2.5 WV2013 Dose per plate (ug)	Count 1025.33 41.33 42.67 Percent S9: Mean Plate Count 552.67	123.70 4.73 4.04 5% Standard Deviation 109.57	24.0 10 Ratio Treated / Solvent	960 43 45 Individe 574	1168 45 45 45 ual Plate 650	948 36 38 Counts
WP2 Positive control with metabol Tester Strain WP2	- -	4NQO Untreated Solvent Compound 2-Anthramine Untreated	2.5 11/1/2013 Dose per plate (ug) 20	Count 1025.33 4133 42.67 Percent S9: Mean Plate Count 552.67 52.33 4167	123.70 4.73 4.04 5% Standard Deviation 109.57 9.71 4.16	24.0 10 Ratio Treated / Solvent	960 43 45 Individe 574 44	1168 45 45 45 ual Plate 650 50	948 36 38 Counts 434 63
WP2 Positive control with metabol Tester Strain	- -	4NQO Untreated Solvent Compound 2-Anthramine Untreated	2.5 11/1/2013 Dose per plate (ug) 20	Count 1025.33 4133 42.67 Percent S9: Mean Plate Count 552.67 52.33	123.70 4.73 4.04 5% Standard Deviation 109.57 9.71 4.16	Ratio Treated / Solvent 13.3 13	960 43 45 Individe 574 44	1168 45 45 45 ual Plate 650 50	948 36 38 Counts 434 63
WP2 Positive control with metabol Tester Strain WP2	- -	4NQO Untreated Solvent Compound 2-Anthramine Untreated	2.5 11/1/2013 Dose per plate (ug) 20	Count 1025.33 4133 42.67 Percent S9: Mean Plate Count 552.67 52.33 4167 Percent S9:	123.70 4.73 4.04 5% Standard Deviation 109.57 9.71 4.16	Ratio Treated / Solvent 13.3 13	960 43 45 Individe 574 44	1168 45 45 45 ual Plate 650 50	948 36 38 Counts 434 63
WP2 Positive control with metabol Tester Strain WP2 Positive control with metabol		4NQO Untreated Solvent Compound 2-Anthramine Untreated Solvent	2.5 11/1/2013 Dose per plate (ug) 20	Count 1025.33 4133 42.67 Percent S9: Mean Plate Count 552.67 52.33 4167 Percent S9:	123.70 4.73 4.04 5% Standard Deviation 109.57 9.71 4.16	Ratio Treated / Solvent 13.3 13 Ratio Treated /	960 43 45 Individe 574 44 43	1168 45 45 45 ual Plate 650 50 37	948 36 38 Counts 434 63 45
WP2 Positive control with metabol Tester Strain WP2 Positive control with metabol Tester Strain	- - - -	4NQO Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound	Dose per plate (ug) 20 11/1/2013 Dose per plate (ug)	Count 1025.33 41.33 42.67 Percent S9: Mean Plate Count 552.67 52.33 4167 Percent S9: Mean Plate Count	123.70 4.73 4.04 5% Standard Deviation 109.57 9.71 4.16 Standard Deviation	Ratio Treated / Solvent 13.3 1.3 Ratio Treated / Solvent	960 43 45 Individu 574 44 43	1168 45 45 45 45 45 650 50 37	948 36 38 Counts 434 63 45
WP2 Positive control with metabol Tester Strain WP2 Positive control with metabol	Color Colo	4NQO Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine	2.5 11/1/2013 Dose per plate (ug) 20	Count 1025.33 41.33 42.67 Percent \$9: Mean Plate Count 552.67 52.33 4167 Percent \$9: Mean Plate Count 553.33	123.70 4.73 4.04 5% Standard Deviation 109.57 9.71 4.16 Standard Deviation 96.77	Ratio Treated / Solvent 13.3 13 Ratio Treated / Solvent 3.6	960 43 45 Individe 574 44 43 Individe 608	1168 45 45 45 45 650 50 37	948 36 38 Counts 434 63 45 Counts 568
WP2 Positive control with metabol Tester Strain WP2 Positive control with metabol Tester Strain	Company Comp	Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine Untreated Compound 2-Anthramine Untreated	Dose per plate (ug) 20 11/1/2013 Dose per plate (ug)	Count 1025.33 4133 42.67 Percent S9: Mean Plate Count 552.67 52.33 4167 Percent S9: Mean Plate Count 533.33 53.33	123.70 4.73 4.04 5% Standard Deviation 109.57 9.71 4.16 Standard Deviation 96.77 8.39	Ratio Treated / Solvent 13.3 1.3 Ratio Treated / Solvent	960 43 45 Individi 574 44 43 Individi 608	1168 45 45 45 45 650 50 37	948 36 38 Counts 434 63 45 Counts 568 63
WP2 Positive control with metabol Tester Strain WP2 Positive control with metabol Tester Strain	Color Colo	4NQO Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine	Dose per plate (ug) 20 11/1/2013 Dose per plate (ug)	Count 1025.33 41.33 42.67 Percent \$9: Mean Plate Count 552.67 52.33 4167 Percent \$9: Mean Plate Count 553.33	123.70 4.73 4.04 5% Standard Deviation 109.57 9.71 4.16 Standard Deviation 96.77	Ratio Treated / Solvent 13.3 13 Ratio Treated / Solvent 3.6	960 43 45 Individe 574 44 43 Individe 608	1168 45 45 45 45 650 50 37	948 36 38 Counts 434 63 45 Counts
WP2 Cositive control with metabol Tester Strain WP2 Cositive control with metabol Tester Strain	Company Comp	Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine Untreated Compound 2-Anthramine Untreated	Dose per plate (ug) 20 11/1/2013 Dose per plate (ug)	Count 1025.33 4133 42.67 Percent S9: Mean Plate Count 552.67 52.33 4167 Percent S9: Mean Plate Count 533.33 53.33	123.70 4.73 4.04 5% Standard Deviation 109.57 9.71 4.16 Standard Deviation 96.77 8.39	Ratio Treated / Solvent 13.3 13 Ratio Treated / Solvent 3.6	960 43 45 Individi 574 44 43 Individi 608	1168 45 45 45 45 650 50 37	948 36 38 Counts 434 63 45 Counts 568 63

Table 41: Individual and mean plate counts for Salmonella TA-98 exposed to Gevo 10262 with JP8 additives (POSF 10263)

est compound without met	abolic activation		11/8/201	3					
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	M ean Plate Count	Standard Deviation	Ratio Treated / Solvent	Individ	ual Plate	Count
TA-98	- '	Gevo 10263	5.000	30.33	1.53	1.0	32	29	30
	-	Gevo 10263	2.500	29.67	3.51	1.0	33	30	26
	-	Gevo 10263	1.250	29.00	6.93	1.0	21	33	33
	_	Gevo 10263	0.625	28.67	2.52	1.0	31	29	26
	_	Gevo 10263	0.313	34.00	5.57	1,1	29	33	40
	_	Gevo 10263	0.156	31.00	3.46	1.0	33	27	33
		0070 0200	0.00	000	0.40		- 00		- 00
est compound with metabo	lic activation:		11/15/201	Percent S9:	5%				
•						Ratio			
Tantan Stania	60 (/.)	Took Final	Dana manulata (ul.)	M ean Plate	Standard	Treated /	1	ual Diata	C
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent		ual Plate	
TA-98	+(5%)	Gevo 10263	5.000	35.67	8.08	0.8	27	37	43
	+(5%)	Gevo 10263	2.500	43.33	4.73	1.0	45	47	38
	+(5%)	Gevo 10263	1.250	48.67	3.79	1.1	53	47	46
	+(5%)	Gevo 10263	0.625	40.67	6.11	0.9	46	34	42
	+(5%)	Gevo 10263	0.313	47.33	4.93	1.1	53	45	44
	+(5%)	Gevo 10263	0.156	53.00	3.61	1.2	50	52	57
est compound with metabo	lic activation:		11/8/201	Percent S9:	10%				
				M ean Plate	Standard	Ratio Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Coun
TA-98	+(10%)	Gevo 10263	5.000	38.00	4.36	0.9	36	43	35
	+(10%)	Gevo 10263	2.500	42.33	9.50	1.0	42	52	33
	+(10%)	Gevo 10263	1.250	44.33	5.13	1.1	40	50	43
	+(10%)	Gevo 10263	0.625	39.00	9.90	1.0	46	32	N/
	+(10%)	Gevo 10263	0.313	40.50	7.78	1.0	35	NA	46
	+(10%)	Gevo 10263	0.156	33.33	1.53	0.8	32	33	35
sitive control without met	abolic activation	:	11/8/201	3					
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individ	ual Plate	Count
TA-98	-	2-Nitrofluorene	3	258.00	12.53	8.7	259	270	24
	-	Untreated		30.33	5.69	1.0	24	35	32
	-	Solvent		29.67	3.51		33	26	30
sitive control with metabo	olic activation:		11/15/201	Percent S9:	5%				
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individ	ual Plate	Coun
TA-98	+(5%)	2-Anthramine	0.5	206.00	1.73	4.6	207	207	20
	+(5%)	Untreated		53.67	9.71	1.2	43	56	62
	+(5%)	Solvent		44.33	8.96		50	34	49
	, , , , ,								
sitive control with metabo	olic activation:		11/8/201	Percent S9:	10%				
				Maar Dist	C4-m-l	Ratio			
Taatan 01::!::	66 ()		Dana manufata (m.)	Mean Plate	Standard	Treated /	Implicate.		^ - · · ·
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent		ual Plate	
TA-98	+(10%)	2-Anthramine	0.5	130.33	0.58	3.2	130	130	13
	+(10%)	Untreated		47.67	7.57	1.2	39	51	53
	+(10%)	Solvent		40.33	8.96		30	45	46
A" indicates value was no			on, was not included in mean o	r statistical analy	ses.				

Table 42: Individual and mean plate counts for Salmonella TA-100 exposed to Gevo 10262 with JP8 additives (POSF 10263)

est compound without met	abolic activation		11/19/2013	3					
•						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Counts
TA-100	-	Gevo 10263	5.000	109.67	8.39	0.8	115	100	114
171.100	-	Gevo 10263	2.500	119.67	7.37	0.9	117	128	114
	_	Gevo 10263	1.250	116.67	8.08	0.8	108	118	124
	_	Gevo 10263	0.625	133.67	18.34	1.0	148	113	140
	-	Gevo 10263	0.313	123.00	7.55	0.9	131	122	116
	-	Gevo 10263	0.156	123.00	6.56	0.9	122	117	130
		Gevo iozos	0.86	123.00	0.30	0.9	122	117	150
	Programme and the second		44/40/00/6	D 0.0	F0/				
est compound with metabo	ilic activation:	1	17/19/2013	Percent S9:	5%	D - 111-			
						Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent		ual Plate	
TA-100	+(5%)	Gevo 10263	5.000	99.33	4.04	0.8	97	104	97
	+(5%)	Gevo 10263	2.500	123.33	6.11	1.0	122	118	130
	+(5%)	Gevo 10263	1.250	127.00	7.00	1.0	130	119	132
	+(5%)	Gevo 10263	0.625	127.00	1.41	1.0	128	126	NA
	+(5%)	Gevo 10263	0.313	125.00	13.00	1.0	132	133	110
	+(5%)	Gevo 10263	0.156	124.00	10.82	1.0	133	112	127
est compound with metabo	olic activation:		11/19/2013	Percent S9:	10%				
•						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Counts
TA-100	+(10%)	Gevo 10263	5.000	126.67	7.51	1.0	127	134	119
1 A - 100	+(10%)	Gevo 10263	2.500	123.67	15.31	1.0	118	112	141
		Gevo 10263	1.250	143.00	6.24	1.2	145	148	136
	+(10%)								
	+(10%)	Gevo 10263	0.625	134.00	11.53	1.1	147	130	125
	+(10%)	Gevo 10263	0.313	124.67	4.04	1.0	127	127	120
	+(10%)	Gevo 10263	0.156	132.00	8.72	1.1	136	138	122
									ļ
ositive control without me	abolic activation	:	11/19/2013	3	•	•			
						Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individ	ual Plate	Counts
TA-100	-	Sodium Azide	3	2175.33	126.21	15.7	2138	2316	2072
	-	Untreated		139.67	2.31	1.0	141	137	141
	-	Solvent		138.67	9.61		137	149	130
ositive control with metabo	olic activation:	·	11/19/2013	Percent S9:	5%	*		·	
						Ratio			
	İ			M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individ	ual Plate	Counte
TA-100	+(5%)	2-Anthramine	0.5	382.67	38.81	3.0	347	424	377
I A - 100	+(5%)	Untreated	0.5	135.67	11.59	1.1	149	128	130
	+(5%)	Solvent		127.67	3.51	1.1	124	128	131
	+(5%)	Solvent		127.07	3.51		<u> 124</u>	Ľδ	131
De altino ao atas to 20 mm. C. C.	a line mostive street		44/46/100/16	D = = = = = = = = = = = = = = = = = = =	40.07				
ositive control with metabo	olic activation:		11/19/2013	Percent S9:	10%				
	İ			L		Ratio			
	1 _			Mean Plate	Standard	Treated /			
		Compound	Dose per plate (ug)	Count	Deviation	Solvent		ual Plate	
Tester Strain	S9 (-/+)			007.00	3.46	2.5	295	295	301
Tester Strain TA-100	+(10%)	2-Anthramine	0.5	297.00		2.0			001
			0.5	132.67	2.31	1.1	134	130	134
	+(10%)	2-Anthramine	0.5						
	+(10%) +(10%)	2-Anthramine Untreated	0.5	132.67	2.31		134	130	134
TA-100	+(10%) +(10%) +(10%)	2-Anthramine Untreated Solvent	0.5	132.67 121.00	2.31 5.66		134	130	134
TA-100	+(10%) +(10%) +(10%) t accurate due to	2-Anthramine Untreated Solvent water condensation	on, was not included in mean o	132.67 121.00	2.31 5.66		134	130	134

Table 43: Individual and mean plate counts for Salmonella TA-1535 exposed to Gevo 10262 with JP8 additives (POSF 10263)

st compound without met	abolic activation		10/24/2013	3					
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent		ual Plate	Count
TA-1535	-	Gevo 10263	5.000	15.33	4.51	1.3	11	20	15
	-	Gevo 10263	2.500	16.00	3.61	1.3	13	20	15
	-	Gevo 10263	1.250	11.33	3.51	0.9	8	15	11
	-	Gevo 10263	0.625	11.67	2.31	1.0	9	13	13
	-	Gevo 10263	0.313	12.67	1.15	1.1	12	14	12
	-	Gevo 10263	0.156	11.00	1.00	0.9	12	11	10
									ļ
st compound with metabo	lic activation:		10/24/2013	Percent S9:	5%				
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent		ual Plate	_
TA-1535	+(5%)	Gevo 10263	5.000	13.00	3.00	0.9	13	10	16
	+(5%)	Gevo 10263	2.500	16.67	4.04	1.2	16	21	13
	+(5%)	Gevo 10263	1.250	17.00	2.83	1.2	NA	19	1
	+(5%)	Gevo 10263	0.625	15.00	1.00	1.0	15	14	1
	+(5%)	Gevo 10263	0.313	16.33	1.53	1.1	15	18	1
	+(5%)	Gevo 10263	0.156	11.50	2.12	0.8	13	10	N.
st compound with metabo	lic activation:		10/24/2013	Percent S9:	10%				
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ıal Plate	Coun
TA-1535	+(10%)	Gevo 10263	5.000	14.67	1.15	1.0	14	16	14
	+(10%)	Gevo 10263	2.500	15.67	1.53	1.0	14	16	17
	+(10%)	Gevo 10263	1.250	11.00	2.65	0.7	13	8	1
	+(10%)	Gevo 10263	0.625	14.67	4.16	1.0	16	18	10
	+(10%)	Gevo 10263	0.313	12.00	4.00	0.8	8	12	16
	+(10%)	Gevo 10263	0.156	10.33	2.08	0.7	8	11	12
sitive control without met	tabolic activation	:	10/24/2013	3					
						Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individ	ual Plate	Coun
TA-1535	-	Sodium Azide	3	445.33	25.03	37.1	444	421	47
	-	Untreated		8.00	2.65	0.7	11	7	6
	-	Solvent		12.00	2.65		15	10	1
			ĺ						
sitive control with metabo	olic activation:		10/24/2013	Percent S9:	5%				
						Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individ	ual Plate	Coun
TA-1535	+(5%)	2-Anthramine	0.5	30.67	5.13	2.1	35	32	2
	+(5%)	Untreated		12.00	3.00	0.8	12	15	9
	+(5%)	Solvent		14.33	5.13		10	13	2
sitive control with metabo	olic activation:		10/24/2013	Percent S9:	10%				
				1		Ratio			
				M ean Plate	Standard	Treated /	1		
	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individ	ual Plate	Coun
Tester Strain			0.5	31.67	4.04	2.1	28	36	3
Tester Strain TA-1535	+(10%)	2-Anthramine	0.5						
	+(10%) +(10%)	Untreated	0.5	17.00	5.29	1.1	15	13	2
	_ , , , , , ,		0.5		5.29 2.52	1.1	15 18	13 13	2:

Table 44: Individual and mean plate counts for Salmonella TA-1537 exposed to Gevo 10262 with JP8 additives (POSF 10263)

	abolic activation:		11/1/2013	3					
						Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individ	ual Plate	Counts
TA-1537	-	Gevo 10263	5.000	15.67	7.02	1.2	15	23	9
	-	Gevo 10263	2.500	16.67	1.53	1.3	17	15	18
	-	Gevo 10263	1.250	14.67	0.58	1.1	15	15	14
	-	Gevo 10263	0.625	13.00	2.65	1.0	11	16	12
	-	Gevo 10263	0.313	12.67	2.52	1.0	10	15	13
	-	Gevo 10263	0.156	14.00	6.08	1.1	21	10	11
	-	Gevo 10263	0.106	14.00	6.08	L.I	21	IU	- 11
	lia aatimatiaa.		MMOOR	Percent S9:	F 0/				
est compound with metabol	ic activation:		IV V20 to	Percent 59:	3%	Ratio			
				M ean Plate	Standard	Treated /			
Tastas Stesie	S9 (-/+)	Tast F	Dana man mlata (ul.)	Count		Solvent	1	ual Diasa	C
Tester Strain		Test Fuel	Dose per plate (uL)		Deviation			ual Plate	
TA-1537	+(5%)	Gevo 10263	5.000	18.67	2.52	0.8	16	21	19
	+(5%)	Gevo 10263	2.500	21.67	3.21	1.0	24	23	18
	+(5%)	Gevo 10263	1.250	19.00	3.00	0.8	16	22	19
	+(5%)	Gevo 10263	0.625	15.50	3.54	0.7	13	NA	18
	+(5%)	Gevo 10263	0.313	17.33	2.52	0.8	20	17	15
	+(5%)	Gevo 10263	0.156	20.00	0.00	0.9	20	20	NA
est compound with metabol	ic activation:		11/1/2013	Percent S9:	10%				
	1			1		Ratio			
				M ean Plate	Standard	Treated /			
Tootor Strain	80 (/.)	Took Eval	Daga par plata (ul.)		Deviation	Solvent	Individu	ual Blata	Caunta
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count				ual Plate	
TA-1537	+(10%)	Gevo 10263	5.000	24.33	5.51	1.3	30	19	24
	+(10%)	Gevo 10263	2.500	19.33	1.15	1.1	18	20	20
	+(10%)	Gevo 10263	1.250	23.33	1.53	1.3	25	22	23
	+(10%)	Gevo 10263	0.625	17.33	2.52	0.9	17	15	20
	+(10%)	Gevo 10263	0.313	19.67	2.52	1.1	22	17	20
	+(10%)	Gevo 10263	0.156	20.33	6.11	1.1	15	27	19
ositive control without meta	abolic activation		11/1/2013						
		T 1		1		Ratio			
				M ean Plate	Standard	Treated /			
									Counte
Tastar Strain	80 (-/-)	Compound	Doco por plato (ua)	Count					
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent		ual Plate	
Tester Strain TA-1537	-	9-Amino acridine	Dose per plate (ug) 100	929.00	126.01	71.5	1056	927	804
	-	9-A mino acridine Untreated		929.00 17.33	126.01 4.62		1056 12	927 20	804 20
	-	9-Amino acridine		929.00	126.01	71.5	1056	927	804
TA-1537	-	9-A mino acridine Untreated	100	929.00 17.33 13.00	126.01 4.62 1.73	71.5	1056 12	927 20	804 20
	-	9-A mino acridine Untreated	100	929.00 17.33	126.01 4.62 1.73	71.5 1.3	1056 12	927 20	804 20
TA-1537	-	9-A mino acridine Untreated	100	929.00 17.33 13.00 Percent S9:	126.01 4.62 1.73	715 13 Ratio	1056 12	927 20	804 20
TA-1537	-	9-A mino acridine Untreated	100	929.00 17.33 13.00	126.01 4.62 1.73	71.5 1.3	1056 12	927 20	804 20
TA-1537	-	9-A mino acridine Untreated	100	929.00 17.33 13.00 Percent S9:	126.01 4.62 173	715 13 Ratio	1056 12 11	927 20	804 20 14
TA-1537 Ositive control with metabol	lic activation:	9-A mino acridine Untreated Solvent	100	929.00 17.33 13.00 Percent S9: Mean Plate Count	126.01 4.62 173 5% Standard Deviation	715 13 Ratio Treated / Solvent	1056 12 11 11	927 20 14	804 20 14
TA-1537 Positive control with metabol Tester Strain		9-Amino acridine Untreated Solvent Compound 2-Anthramine	100 11/1/2015 Dose per plate (ug)	929.00 17.33 13.00 Percent S9: Mean Plate Count 52.67	126.01 4.62 1.73 5% Standard Deviation 2.52	71.5 1.3 Ratio Treated /	1056 12 11 11 Individe 55	927 20 14	804 20 14 Counts
TA-1537 Positive control with metabol Tester Strain	S9 (-/+) +(5%) +(5%)	9-Amino acridine Untreated Solvent Compound 2-Anthramine Untreated	100 11/1/2015 Dose per plate (ug)	929.00 17.33 13.00 8 Percent S9: Mean Plate Count 52.67 17.67	126.01 4.62 1.73 5% Standard Deviation 2.52 2.52	715 13 Ratio Treated / Solvent 2.3	1056 12 11 11 Individe 55 20	927 20 14 ual Plate 50	804 20 14 Counts 53 15
TA-1537 Positive control with metabol Tester Strain	- - - - lic activation: S9 (-/+) +(5%)	9-Amino acridine Untreated Solvent Compound 2-Anthramine	100 11/1/2015 Dose per plate (ug)	929.00 17.33 13.00 Percent S9: Mean Plate Count 52.67	126.01 4.62 1.73 5% Standard Deviation 2.52	715 13 Ratio Treated / Solvent 2.3	1056 12 11 11 Individe 55	927 20 14 ual Plate 50	804 20 14 Counts
TA-1537 Ositive control with metabol Tester Strain TA-1537	- - -	9-Amino acridine Untreated Solvent Compound 2-Anthramine Untreated	100 11/1/2013 Dose per plate (ug) 3	929.00 17.33 13.00 Percent \$9: Mean Plate Count 52.67 17.67 22.67	126.01 4.62 173 5% Standard Deviation 2.52 2.52 3.21	715 13 Ratio Treated / Solvent 2.3	1056 12 11 11 Individe 55 20	927 20 14 ual Plate 50	804 20 14 Counts 53 15
TA-1537 Positive control with metabol Tester Strain	- - -	9-Amino acridine Untreated Solvent Compound 2-Anthramine Untreated	100 11/1/2013 Dose per plate (ug) 3	929.00 17.33 13.00 8 Percent S9: Mean Plate Count 52.67 17.67	126.01 4.62 173 5% Standard Deviation 2.52 2.52 3.21	715 13 Ratio Treated / Solvent 23 08	1056 12 11 11 Individe 55 20	927 20 14 ual Plate 50	804 20 14 Counts 53 15
TA-1537 Ositive control with metabol Tester Strain TA-1537	- - -	9-Amino acridine Untreated Solvent Compound 2-Anthramine Untreated	100 11/1/2013 Dose per plate (ug) 3	929.00 17.33 13.00 8 Percent S9: Mean Plate Count 52.67 17.67 22.67	126.01 4.62 173 5% Standard Deviation 2.52 2.52 3.21	715 13 Ratio Treated / Solvent 2.3 0.8	1056 12 11 11 Individe 55 20	927 20 14 ual Plate 50	804 20 14 Counts 53 15
TA-1537 Positive control with metabol Tester Strain TA-1537 Positive control with metabol	- -	9-Aminoacridine Untreated Solvent Compound 2-Anthramine Untreated Solvent	100 11/1/2013 Dose per plate (ug) 3	929.00 17.33 13.00 8 Percent S9: Mean Plate Count 52.67 17.67 22.67 Percent S9:	126.01 4.62 1.73 5% Standard Deviation 2.52 2.52 3.21 10% Standard	Ratio Treated / Solvent 23 0.8 Ratio Treated /	1056 12 11 11 Individ 55 20	927 20 14 ual Plate 50 18 24	804 20 14 Counts 53 15 25
TA-1537 Positive control with metabol Tester Strain TA-1537 Positive control with metabol Tester Strain	Control Cont	9-Amino acridine Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound	Dose per plate (ug) 3 11/1/2015	929.00 17.33 13.00 Percent S9: Mean Plate Count 52.67 17.67 22.67 Mean Plate Count Count	126.01 4.62 173 5% Standard Deviation 2.52 2.52 3.21 10% Standard Deviation	Ratio Treated / Solvent 23 0.8 Ratio Treated / Solvent	1056 12 11 Individu 55 20 19	927 20 14 ual Plate 50 18 24	804 20 14 Counts 53 15 25
TA-1537 Positive control with metabol Tester Strain TA-1537 Positive control with metabol	- -	9-Aminoacridine Untreated Solvent Compound 2-Anthramine Untreated Solvent	100 11/1/2013 Dose per plate (ug) 3	929.00 17.33 13.00 8 Percent S9: Mean Plate Count 52.67 17.67 22.67 Percent S9:	126.01 4.62 1.73 5% Standard Deviation 2.52 2.52 3.21 10% Standard	715 13 Ratio Treated / Solvent 23 0.8 Ratio Treated /	1056 12 11 11 Individ 55 20	927 20 14 4 50 18 24 ual Plate 50 18 24	804 20 14 Counts 53 15 25
TA-1537 Positive control with metabol Tester Strain TA-1537 Positive control with metabol Tester Strain	Control Cont	9-Amino acridine Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound	Dose per plate (ug) 3 11/1/2015	929.00 17.33 13.00 Percent S9: Mean Plate Count 52.67 17.67 22.67 Mean Plate Count Count	126.01 4.62 173 5% Standard Deviation 2.52 2.52 3.21 10% Standard Deviation	Ratio Treated / Solvent 23 0.8 Ratio Treated / Solvent	1056 12 11 Individu 55 20 19	927 20 14 ual Plate 50 18 24	804 20 14 Counts 53 15 25
TA-1537 Cositive control with metabol Tester Strain TA-1537 Cositive control with metabol Tester Strain	Color Colo	9-Amino acridine Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine	Dose per plate (ug) 3 11/1/2015	929.00 17.33 13.00 Percent S9: Mean Plate Count 52.67 17.67 22.67 Percent S9: Mean Plate Count 33.67	126.01 4.62 173 5% Standard Deviation 2.52 2.52 3.21 10% Standard Deviation 2.31	Ratio Treated / Solvent 23 08 Ratio Treated / Solvent 18	1056 12 11 11 Individe 55 20 19	927 20 14 4 50 18 24 ual Plate 50 18 24	804 20 14 Counts 53 55 25 Counts 35
TA-1537 ositive control with metabol Tester Strain TA-1537 ositive control with metabol Tester Strain	c c c c c c c c c c	9-Amino acridine Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine Untreated Untreated Untreated Untreated Untreated Untreated	Dose per plate (ug) 3 11/1/2015	929.00 17.33 13.00 8 Percent S9: Mean Plate Count 52.67 17.67 22.67 8 Percent S9: Mean Plate Count 33.67 26.67	126.01 4.62 173 5% Standard Deviation 2.52 2.52 3.21 10% Standard Deviation 2.31 5.03	Ratio Treated / Solvent 23 08 Ratio Treated / Solvent 18	1056 12 11 11 Individe 55 20 19 Individe 35 32	927 20 14 4 50 18 24 24	804 20 14

Table 45: Individual and mean plate counts for *E. coli* WP2 exposed to Gevo 10262 with JP8 additives (POSF 10263)

	bolic activation:		12/11/2013						
						Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	Count
WP2		Gevo 10263	5.000	46.67	2.08	1.1	49	46	45
	-	Gevo 10263	2.500	44.33	10.97	1.0	53	32	48
	-	Gevo 10263	1.250	37.33	7.57	0.9	46	32	34
	_	Gevo 10263	0.625	37.00	2.65	0.9	35	36	40
		Gevo 10263		34.00				32	
	-		0.313		3.46	0.8	32		38
	-	Gevo 10263	0.156	37.67	3.06	0.9	37	41	35
				_	_				
est compound with metaboli	ic activation:		12/11/2013	Percent S9:	5%		1		
						Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	Counts
WP2	+(5%)	Gevo 10263	5.000	47.67	2.08	1.1	46	47	50
	+(5%)	Gevo 10263	2.500	40.67	2.08	1.0	39	40	43
	+(5%)	Gevo 10263	1.250	47.00	2.65	1.1	44	48	49
	+(5%)	Gevo 10263	0.625	49.00	7.81	1.2	44	58	45
	+(5%)	Gevo 10263	0.313	50.00	14.73	1.2	34	53	63
				42.00	1.73	1.0	43	43	40
	+(5%)	Gevo 10263	0.156	42.00	1./3	1.0	43	43	40
est compound with metaboli	ic activation:	1	12/11/2013	Percent S9:	10%		<u> </u>		
						Ratio			
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	Counts
WP2	+(10%)	Gevo 10263	5.000	51.33	9.71	1.3	49	43	62
	+(10%)	Gevo 10263	2.500	46.67	6.66	1.2	50	51	39
	+(10%)	Gevo 10263	1.250	57.00	6.24	1.4	64	52	55
	+(10%)	Gevo 10263	0.625	53.00	7.21	1.3	51	61	47
	+(10%)	Gevo 10263	0.313	51.00	3.61	1.3	48	50	55
		Gevo 10263	0.156	47.67	3.51	1.2	51	44	48
	+(10%)	Gev0 10263	0.56	47.07	3.31	I.Z	31	44	40
			40 / 44/00 M						
Positive control without meta	abolic activation		12/11/2013						
						Ratio			
				1					
-				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	M ean Plate Count	Standard Deviation	Treated / Solvent	Individu	ual Plate	Counts
Tester Strain WP2	S9 (-/+)	Compound 4NQO	Dose per plate (ug)				Individa 960	ual Plate 1168	
				Count	Deviation	Solvent			
	-	4NQO Untreated		Count 1025.33 41.33	123.70 4.73	Solvent 24.0	960 43	1168 45	948 36
	-	4NQO		Count 1025.33	Deviation 123.70	Solvent 24.0	960	1168	948
WP2	-	4NQO Untreated	2.5	Count 1025.33 41.33 42.67	123.70 4.73 4.04	Solvent 24.0	960 43	1168 45	948 36
	-	4NQO Untreated	2.5	Count 1025.33 41.33	123.70 4.73 4.04	Solvent 24.0 1.0	960 43	1168 45	948 36
WP2	-	4NQO Untreated	2.5	Count 1025.33 4133 42.67 Percent S9:	Deviation 123.70 4.73 4.04	Solvent 24.0 1.0 Ratio	960 43	1168 45	948 36
WP2 Positive control with metabol	- - - lic activation:	4NQO Untreated Solvent	2.5	Count 1025.33 41.33 42.67 Percent S9:	Deviation 123.70 4.73 4.04 5% Standard	Solvent 24.0 10 Ratio Treated /	960 43 45	1168 45 45	948 36 38
WP2 Positive control with metabol Tester Strain	ic activation:	4NQO Untreated Solvent	2.5 12/11/2013 Dose per plate (ug)	Count 1025.33 4133 42.67 Percent S9: Mean Plate Count	Deviation	24.0 1.0 Ratio Treated / Solvent	960 43 45	1168 45 45 45	948 36 38
WP2 Ositive control with metabol	- - - iic activation: S9 (-/+) +(5%)	4NQO Untreated Solvent Compound 2-Anthramine	2.5	Count 1025.33 41.33 42.67 Percent S9: Mean Plate Count 552.67	Deviation	Ratio Treated / Solvent 13.3	960 43 45 Individu 574	1168 45 45 45 ual Plate 650	948 36 38 Counts
WP2 Positive control with metabol Tester Strain	S9 (-/+) +(5%) +(5%)	4NQO Untreated Solvent Compound 2-Anthramine Untreated	2.5 12/11/2013 Dose per plate (ug)	Count 1025.33 41.33 42.67 Percent \$9: Mean Plate Count 552.67 52.33	Deviation 123.70 4.73 4.04 5% Standard Deviation 109.57 9.71	24.0 1.0 Ratio Treated / Solvent	960 43 45 Individu 574 44	1168 45 45 45 ual Plate 650 50	948 36 38 Counts 434 63
WP2 Positive control with metabol Tester Strain	- - - iic activation: S9 (-/+) +(5%)	4NQO Untreated Solvent Compound 2-Anthramine	2.5 12/11/2013 Dose per plate (ug)	Count 1025.33 41.33 42.67 Percent S9: Mean Plate Count 552.67	Deviation	Ratio Treated / Solvent 13.3	960 43 45 Individu 574	1168 45 45 45 ual Plate 650	948 36 38 Counts
WP2 Positive control with metabol Tester Strain	S9 (-/+) +(5%) +(5%)	4NQO Untreated Solvent Compound 2-Anthramine Untreated	2.5 12/11/2013 Dose per plate (ug)	Count 1025.33 41.33 42.67 Percent \$9: Mean Plate Count 552.67 52.33	Deviation 123.70 4.73 4.04 5% Standard Deviation 109.57 9.71	Ratio Treated / Solvent 13.3	960 43 45 Individu 574 44	1168 45 45 45 ual Plate 650 50	948 36 38 Counts 434 63
WP2 Positive control with metabol Tester Strain	S9 (-/+) +(5%) +(5%)	4NQO Untreated Solvent Compound 2-Anthramine Untreated	2.5 12/1/2013 Dose per plate (ug) 20	Count 1025.33 41.33 42.67 Percent \$9: Mean Plate Count 552.67 52.33	Deviation 123.70 4.73 4.04 5% Standard Deviation 109.57 9.71 4.16	Ratio Treated / Solvent 13.3	960 43 45 Individu 574 44	1168 45 45 45 ual Plate 650 50	948 36 38 Counts 434 63
WP2 Positive control with metabol Tester Strain WP2	S9 (-/+) +(5%) +(5%)	4NQO Untreated Solvent Compound 2-Anthramine Untreated	2.5 12/1/2013 Dose per plate (ug) 20	Count 1025.33 4133 42.67 Percent \$9: Mean Plate Count 552.67 52.33 4167	Deviation 123.70 4.73 4.04 5% Standard Deviation 109.57 9.71 4.16	Ratio Treated / Solvent 13.3	960 43 45 Individu 574 44	1168 45 45 45 ual Plate 650 50	948 36 38 Counts 434 63
WP2 Positive control with metabol Tester Strain WP2	S9 (-/+) +(5%) +(5%)	4NQO Untreated Solvent Compound 2-Anthramine Untreated	2.5 12/1/2013 Dose per plate (ug) 20	Count 1025.33 4133 42.67 Percent S9: Mean Plate Count 552.67 52.33 4167 Percent S9:	Deviation 123.70 4.73 4.04 5% Standard Deviation 109.57 9.71 4.16	Ratio Treated / Solvent 13.3 Ratio	960 43 45 Individu 574 44	1168 45 45 45 ual Plate 650 50	948 36 38 Counts 434 63
WP2 Positive control with metabol Tester Strain WP2 Positive control with metabol		4NQO Untreated Solvent Compound 2-Anthramine Untreated Solvent	2.5 12/11/2013 Dose per plate (ug) 20 12/11/2013	Count 1025.33 4133 42.67 Percent \$9: Mean Plate Count 552.67 52.33 4167 Percent \$9:	Deviation 123.70 4.73 4.04 5% Standard Deviation 109.57 9.71 4.16 Standard	Ratio Treated / Solvent 13 Ratio Treated / Treated / Treated /	960 43 45 Individe 574 44 43	1168 45 45 45 45 45 650 50 37	948 36 38 Counts 434 63 45
WP2 Positive control with metabol Tester Strain WP2 Positive control with metabol Tester Strain	- -	4NQO Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound	2.5 12/1/2015 Dose per plate (ug) 20 12/1/2015 Dose per plate (ug)	Count 1025.33 4133 42.67 Percent \$9: Mean Plate Count 552.67 52.33 4167 Percent \$9: Mean Plate Count	Deviation 123.70 4.73 4.04 5%	Ratio Treated / Solvent 13.3 13 Ratio Treated / Solvent Solvent	960 43 45 Individu 574 44 43	1168 45 45 45 45 650 37	948 36 38 38 Counts 434 63 45
WP2 Positive control with metabol Tester Strain WP2 Positive control with metabol	- - -	4NQO Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine	2.5 12/11/2013 Dose per plate (ug) 20 12/11/2013	Count 1025.33 41.33 42.67 Percent S9: Mean Plate Count 552.67 52.33 41.67 Percent S9: Mean Plate Count 552.67 52.33	Deviation 123.70 4.73 4.04 5%	Ratio Treated / Solvent 13.3 13 Ratio Treated / Solvent 13.6	960 43 45 Individe 574 44 43 Individe 608	1168 45 45 45 45 650 50 37	948 36 38 Counts 434 63 45 Counts
WP2 Positive control with metabol Tester Strain WP2 Positive control with metabol Tester Strain		4NQO Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine Untreated	2.5 12/1/2015 Dose per plate (ug) 20 12/1/2015 Dose per plate (ug)	Count 1025.33 4133 42.67 Percent S9: Mean Plate Count 552.67 52.33 4167 Percent S9: Mean Plate Count 533.33 53.33	Deviation 123.70 4.73 4.04 5% Standard Deviation 109.57 9.71 4.16 Standard Deviation 096.77 8.39	Ratio Treated / Solvent 13.3 13 Ratio Treated / Solvent Solvent	960 43 45 Individe 574 44 43 Individe 608 49	1168 45 45 45 45 650 50 37	948 36 38 Count: 434 63 45 Count: 568 63
WP2 Cositive control with metabol Tester Strain WP2 Cositive control with metabol Tester Strain	- - -	4NQO Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine	2.5 12/1/2015 Dose per plate (ug) 20 12/1/2015 Dose per plate (ug)	Count 1025.33 41.33 42.67 Percent S9: Mean Plate Count 552.67 52.33 41.67 Percent S9: Mean Plate Count 552.67 52.33	Deviation 123.70 4.73 4.04 5%	Ratio Treated / Solvent 13.3 13 Ratio Treated / Solvent 13.6	960 43 45 Individe 574 44 43 Individe 608	1168 45 45 45 45 650 50 37	948 36 38 Counts 434 63 45 Counts

Table 46: Individual and mean plate counts for *Salmonella* TA-98 exposed to Swedish Biofuel 7633 with JP8 additives (POSF 8452)

Test compound without meta	abolic activation		11/8/2013	3					
cor compound without meta	abone activation.	T I	170/20 k	Ī		Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	Counts
TA-98	39 (-/+)	SB	5.000	34.33	10.07	1.2	45	33	25
1A-96	-								
	-	SB	2.500	38.00	8.54	1.3	47	30	37
	-	SB	1.250	25.67	4.51	0.9	26	21	30
	-	SB	0.625	30.33	3.79	1.0	32	33	26
	-	SB	0.313	28.67	1.53	1.0	29	27	30
	-	SB	0.156	27.33	4.04	0.9	25	32	25
Test compound with metabo	lic activation:		11/15/2013	Percent S9:	5%				
•						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	Counte
TA-98	+(5%)	SB	5.000	53.33	6.66	1.2	50	61	49
TA-90									
	+(5%)	SB	2.500	45.00	4.58	1.0	41	50	44
	+(5%)	SB	1.250	41.33	2.31	0.9	40	40	44
	+(5%)	SB	0.625	47.00	5.29	1.1	53	43	45
	+(5%)	SB	0.313	44.00	13.00	1.0	59	37	36
	+(5%)	SB	0.156	54.00	9.90	1.2	47	61	NA
est compound with metabo	lic activation:		11/8/2013	Percent S9:	10%				
			77072010		1	Ratio			
				M ean Plate	Standard	Treated /			
Tastas Steele	60 (/.)	Tast First	Dana man mlata (ul.)				1	Diete	C
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent		ual Plate	1
TA-98	+(10%)	SB	5.000	47.00	12.17	1.2	55	53	33
	+(10%)	SB	2.500	40.33	11.93	1.0	27	50	44
	+(10%)	SB	1.250	42.67	9.02	1.1	52	42	34
	+(10%)	SB	0.625	36.50	6.36	0.9	41	32	NA
	+(10%)	SB	0.313	37.67	8.50	0.9	38	46	29
	+(10%)	SB	0.156	34.67	3.79	0.9	33	32	39
	· /								
Positive control without meta	abolic activation		11/8/2013	}					
COMITO COMMON MANOR AND ACTION			110,20 %			Ratio			
				Maan Bloto	Ctondord				
Tantan Strain	50 (()		Dana man mlata ()	M ean Plate	Standard	Treated /	I al lo . l al .	ual Diata	C
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Treated / Solvent		ual Plate	1
Tester Strain TA-98	-	2-Nitrofluorene	Dose per plate (ug)	Count 258.00	Deviation 12.53	Treated / Solvent 8.7	259	270	245
		2-Nitrofluorene Untreated		258.00 30.33	Deviation 12.53 5.69	Treated / Solvent	259 24	270 35	245 32
	-	2-Nitrofluorene		Count 258.00	Deviation 12.53	Treated / Solvent 8.7	259	270	245
		2-Nitrofluorene Untreated		258.00 30.33	Deviation 12.53 5.69	Treated / Solvent 8.7	259 24	270 35	245 32
TA-98	-	2-Nitrofluorene Untreated	3	258.00 30.33	Deviation 12.53 5.69 3.51	Treated / Solvent 8.7	259 24	270 35	245 32
	-	2-Nitrofluorene Untreated	3	258.00 30.33 29.67	Deviation 12.53 5.69 3.51	Treated / Solvent 8.7	259 24	270 35	245 32
TA-98	-	2-Nitrofluorene Untreated	3	258.00 30.33 29.67	Deviation 12.53 5.69 3.51	Treated / Solvent 8.7 1.0	259 24	270 35	245 32
TA-98 Positive control with metabo	- - - lic activation:	2-Nitrofluorene Untreated Solvent	3 11/15/2013	Count 258.00 30.33 29.67 3 Percent S9: Mean Plate	Deviation	Treated / Solvent 8.7 10 Ratio Treated /	259 24 33	270 35 26	245 32 30
TA-98 Positive control with metabo Tester Strain	- - - - lic activation:	2-Nitrofluorene Untreated Solvent	3 11/15/2015 Dose per plate (ug)	Count 258.00 30.33 29.67 B Percent S9: Mean Plate Count	Deviation	Ratio Treated / Solvent 8.7 10	259 24 33	270 35 26	245 32 30
TA-98 Positive control with metabo	- - - - - - - - - - - - - - - - - - -	2-Nitrofluorene Untreated Solvent Compound 2-Anthramine	3 11/15/2013	Count 258.00 30.33 29.67 B Percent S9: Mean Plate Count 206.00	Deviation	Ratio Treated / Solvent 8.7 10 Ratio Treated / Solvent 4.6	259 24 33 Individe 207	270 35 26 ual Plate 207	245 32 30 Counts
TA-98 Positive control with metabo Tester Strain	- - - - - - - - - - - - - - - - - - -	2-Nitrofluorene Untreated Solvent Compound 2-Anthramine Untreated	3 11/15/2015 Dose per plate (ug)	Count 258.00 30.33 29.67 3 Percent S9: Mean Plate Count 206.00 53.67	Deviation 12.53 5.69 3.51 5% Standard Deviation 1.73 9.71	Ratio Treated / Solvent 8.7 10	259 24 33 Individe 207 43	270 35 26 ual Plate 207 56	245 32 30 Counts 204 62
TA-98 Positive control with metabo Tester Strain	- - - - - - - - - - - - - - - - - - -	2-Nitrofluorene Untreated Solvent Compound 2-Anthramine	3 11/15/2015 Dose per plate (ug)	Count 258.00 30.33 29.67 B Percent S9: Mean Plate Count 206.00	Deviation	Ratio Treated / Solvent 8.7 10 Ratio Treated / Solvent 4.6	259 24 33 Individe 207	270 35 26 ual Plate 207	245 32 30 Counts 204
TA-98 **Cositive control with metabo **Tester Strain** TA-98	- - -	2-Nitrofluorene Untreated Solvent Compound 2-Anthramine Untreated	3 11/15/2015 Dose per plate (ug) 0.5	Count 258.00 30.33 29.67 3 Percent S9: Mean Plate Count 206.00 53.67 44.33	Deviation 12.53 5.69 3.51 5% Standard Deviation 173 9.71 8.96	Ratio Treated / Solvent 8.7 10 Ratio Treated / Solvent 4.6	259 24 33 Individe 207 43	270 35 26 ual Plate 207 56	245 32 30 Counts 204 62
TA-98 Positive control with metabo Tester Strain TA-98	- - -	2-Nitrofluorene Untreated Solvent Compound 2-Anthramine Untreated	3 11/15/2015 Dose per plate (ug) 0.5	Count 258.00 30.33 29.67 3 Percent S9: Mean Plate Count 206.00 53.67	Deviation 12.53 5.69 3.51 5% Standard Deviation 173 9.71 8.96	Treated / Solvent 8.7 10 Ratio Treated / Solvent 4.6 12	259 24 33 Individe 207 43	270 35 26 ual Plate 207 56	245 32 30 Counts 204 62
TA-98 Positive control with metabo Tester Strain TA-98	- - -	2-Nitrofluorene Untreated Solvent Compound 2-Anthramine Untreated	3 11/15/2015 Dose per plate (ug) 0.5	Count 258.00 30.33 29.67 3 Percent S9: Mean Plate Count 206.00 53.67 44.33	Deviation 12.53 5.69 3.51 5% Standard Deviation 173 9.71 8.96	Ratio Treated / Solvent 8.7 10 Ratio Treated / Solvent 4.6 12	259 24 33 Individe 207 43	270 35 26 ual Plate 207 56	245 32 30 Counts 204 62
TA-98 Positive control with metabo Tester Strain TA-98	- - -	2-Nitrofluorene Untreated Solvent Compound 2-Anthramine Untreated	3 11/15/2015 Dose per plate (ug) 0.5	Count 258.00 30.33 29.67 3 Percent S9: Mean Plate Count 206.00 53.67 44.33	Deviation 12.53 5.69 3.51 5% Standard Deviation 173 9.71 8.96	Treated / Solvent 8.7 10 Ratio Treated / Solvent 4.6 12	259 24 33 Individe 207 43	270 35 26 ual Plate 207 56	245 32 30 Counts 204 62
TA-98 Positive control with metabo Tester Strain TA-98	- - - - - - - - - - - - - - - - - - -	2-Nitrofluorene Untreated Solvent Compound 2-Anthramine Untreated	3 11/15/2015 Dose per plate (ug) 0.5	Count 258.00 30.33 29.67 Percent S9: Mean Plate Count 206.00 53.67 44.33 Percent S9:	Deviation 12.53 5.69 3.51 5% Standard Deviation 173 9.71 8.96	Ratio Treated / Solvent 8.7 10 Ratio Treated / Solvent 4.6 12	259 24 33 Individe 207 43 50	270 35 26 ual Plate 207 56	245 32 30 Counts 204 62 49
TA-98 Positive control with metabo Tester Strain TA-98 Positive control with metabo		2-Nitrofluorene Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound	Dose per plate (ug) 0.5 11/8/2013	Count	Deviation 12.53 5.69 3.51	Treated / Solvent 8.7 10 Ratio Treated / Solvent 4.6 12 Ratio Treated / Tr	259 24 33 Individe 207 43 50	270 35 26 28 29 207 56 34	245 32 30 Counts 204 62 49
TA-98 Positive control with metabo Tester Strain TA-98 Positive control with metabo Tester Strain		2-Nitrofluorene Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine	3 11/15/2015 Dose per plate (ug) 0.5	Count 258.00 30.33 29.67 B Percent S9: Mean Plate Count 206.00 53.67 44.33 B Percent S9: Mean Plate Count 130.33	Deviation 12.53 5.69 3.51	Ratio Treated / Solvent Ratio Treated / Solvent 4.6 12 Ratio Treated / Solvent 3.2	259 24 33 Individe 207 43 50	270 35 26 26 207 56 34 207 56	245 32 30 Counts 204 62 49 Counts
TA-98 Positive control with metabo Tester Strain TA-98 Positive control with metabo Tester Strain		2-Nitrofluorene Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine Untreated Untreated Untreated Untreated Untreated Untreated	Dose per plate (ug) 0.5 11/8/2013	Count 258.00 30.33 29.67 Percent S9: Mean Plate Count 206.00 53.67 44.33 Percent S9: Mean Plate Count 130.33 47.67	Deviation 12.53 5.69 3.51 5% Standard Deviation 173 9.71 8.96 Standard Deviation 0.58 7.57	Treated / Solvent 8.7 10 Ratio Treated / Solvent 4.6 12 Ratio Treated / Solvent	259 24 33 Individe 207 43 50 Individe 30 39	270 35 26 26 207 56 34 207 56 34	245 32 30 Counts 204 62 49 Counts 131 53
TA-98 Cositive control with metabo Tester Strain TA-98 Cositive control with metabo Tester Strain		2-Nitrofluorene Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine	Dose per plate (ug) 0.5 11/8/2013	Count 258.00 30.33 29.67 B Percent S9: Mean Plate Count 206.00 53.67 44.33 B Percent S9: Mean Plate Count 130.33	Deviation 12.53 5.69 3.51	Ratio Treated / Solvent Ratio Treated / Solvent 4.6 12 Ratio Treated / Solvent 3.2	259 24 33 Individe 207 43 50	270 35 26 26 207 56 34 207 56	245 32 30 Counts 204 62 49 Counts
TA-98 Tester Strain TA-98 Tester Strain TA-98 Tester Strain TA-98	S9 (-/+) +(5%) +(5%) +(5%) +(5%) +(5%) +(10%) +(10%) +(10%)	2-Nitrofluorene Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine Untreated Solvent One of the second of the	Dose per plate (ug) 0.5 1/8/2013 1/8/2013 Dose per plate (ug) 0.5	Count 258.00 30.33 29.67 Percent S9: Mean Plate Count 206.00 53.67 44.33 Percent S9: Mean Plate Count 130.33 47.67 40.33	Deviation 12.53 5.69 3.51 5% Standard Deviation 173 9.71 8.96 Standard Deviation 0.58 7.57 8.96	Ratio Treated / Solvent Ratio Treated / Solvent 4.6 12 Ratio Treated / Solvent 3.2	259 24 33 Individe 207 43 50 Individe 30 39	270 35 26 26 207 56 34 207 56 34	245 32 30 Counts 204 62 49 Counts 131 53
TA-98 Ositive control with metabo Tester Strain TA-98 Ositive control with metabo Tester Strain TA-98		2-Nitrofluorene Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine Untreated Solvent Untreated Solvent water condensatio	Dose per plate (ug) 0.5 1/8/2013 1/8/2013 Dose per plate (ug) 0.5	Count 258.00 30.33 29.67 Percent S9: Mean Plate Count 206.00 53.67 44.33 Percent S9: Mean Plate Count 130.33 47.67 40.33	Deviation 12.53 5.69 3.51 5% Standard Deviation 173 9.71 8.96 Standard Deviation 0.58 7.57 8.96	Ratio Treated / Solvent Ratio Treated / Solvent 4.6 12 Ratio Treated / Solvent 3.2	259 24 33 Individe 207 43 50 Individe 30 39	270 35 26 26 207 56 34 207 56 34	245 32 30 Counts 204 62 49 Counts 31 53
TA-98 Tester Strain TA-98 Tositive control with metabo Tester Strain TA-98 Tester Strain TA-98		2-Nitrofluorene Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine Untreated Solvent Untreated Solvent water condensatio	Dose per plate (ug) 0.5 1/8/2013 1/8/2013 Dose per plate (ug) 0.5	Count 258.00 30.33 29.67 Percent S9: Mean Plate Count 206.00 53.67 44.33 Percent S9: Mean Plate Count 130.33 47.67 40.33	Deviation 12.53 5.69 3.51 5% Standard Deviation 173 9.71 8.96 Standard Deviation 0.58 7.57 8.96	Ratio Treated / Solvent Ratio Treated / Solvent 4.6 12 Ratio Treated / Solvent 3.2	259 24 33 Individe 207 43 50 Individe 30 39	270 35 26 26 207 56 34 207 56 34	245 32 30 Counts 204 62 49 Counts 31 53

Table 47: Individual and mean plate counts for *Salmonella* TA-100 exposed to Swedish Biofuel 7633 with JP8 additives (POSF 8452)

	abolic activation:		10/15/2013						
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Mean Plate Count	Standard Deviation	Ratio Treated / Solvent		ual Plate	
TA-100	-	SB	5.000	105.67	3.51	0.9	109	102	10
	-	SB	2.500	101.67	7.23	0.8	98	110	97
	-	SB	1.250	127.00	22.27	1.0	147	103	13
	-	SB	0.625	115.00	14.11	0.9	117	128	10
	-	SB	0.313	114.00	5.00	0.9	119	114	10
	-	SB	0.156	126.33	20.13	1.0	145	105	12
t compound with metaboli	ic activation:		11/19/2013	Percent S9:	5%				
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ual Plate	Coun
TA-100	+(5%)	SB	5.000	110.00	3.00	0.8	110	113	10
	+(5%)	SB	2.500	117.67	4.93	0.9	112	121	12
	+(5%)	SB	1.250	116.00	12.12	0.9	103	127	11
	+(5%)	SB	0.625	122.67	4.04	0.9	122	127	11
	+(5%)	SB	0.313	113.00	8.49	0.9	119	NA.	10
	+(5%)	SB	0.156	116.50	7.78	0.9	111	122	N/
	1 (370)	25	0.00	10.00	7.70	0.0		<u> </u>	147
t compound with metaboli	ic activation:		10/15/2013	Percent S9:	10 %				
st compound with metaboli	C activation.	1	10/ 15/20 10	l elcelle 03.	10 /0	Ratio	I		
				M ean Plate	Standard	Treated /			
Tantor Strain	S9 (-/+)	Test Fuel	Dogo por plata (ul.)	Count	Deviation	Solvent	Individu	ual Plate	C
Tester Strain			Dose per plate (uL)						
TA-100	+(10%)	SB SB	5.000	112.67	10.97	0.9	119	119	10
	+(10%)		2.500	108.67	9.81	0.8	103	120	10
	+(10%)	SB	1.250	115.33	7.57	0.9	110	112	12
	+(10%)	SB	0.625	114.67	7.02	0.9	122	114	10
	+(10%)	SB	0.313	125.33	13.32	1.0	114	140	12
	+(10%)	SB	0.156	124.33	3.21	1.0	123	128	12
sitive control without meta	bolic activation:	<u> </u>	10/15/2013	1					
						Ratio			
					Standard	Treated /			
				M ean Plate					
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent		ual Plate	
Tester Strain TA-100	S9 (-/+)	Compound Sodium Azide	Dose per plate (ug)	Count 1433.00		Solvent 11.8	Individu 1402	1498	
				Count 1433.00 121.33	Deviation				139
	-	Sodium Azide		Count 1433.00	Deviation 56.31	11.8	1402	1498	139
		Sodium Azide Untreated	3	Count 1433.00 121.33 121.67	56.31 9.07 8.96	11.8	1402 125	1498 128	139
		Sodium Azide Untreated	3	Count 1433.00 121.33	56.31 9.07 8.96	11.8 1.0	1402 125	1498 128	139 11
TA-100		Sodium Azide Untreated	3	Count 1433.00 121.33 121.67	56.31 9.07 8.96	11.8 10 Ratio	1402 125	1498 128	139
TA-100		Sodium Azide Untreated	3	Count 1433.00 121.33 121.67	56.31 9.07 8.96	11.8 1.0	1402 125	1498 128	139
TA-100 Sitive control with metabol		Sodium Azide Untreated Solvent	3	Count 1433.00 12133 12167 Percent S9: Mean Plate Count	56.31 9.07 8.96	Ratio Treated / Solvent	1402 125 132	1498 128	139 11 11
TA-100 Sitive control with metabol	- - - lic activation:	Sodium Azide Untreated Solvent	10/15/2013	Count 1433.00 12133 12167 Percent S9:	Deviation	11.8 10 Ratio Treated /	1402 125 132	1498 128 116	139 11 11
TA-100 sitive control with metabol	ic activation:	Sodium Azide Untreated Solvent	10/15/2013 Dose per plate (ug)	Count 1433.00 12133 12167 Percent S9: Mean Plate Count	Deviation	Ratio Treated / Solvent	1402 125 132 Individu	1498 128 116	139 11 11 Coun 56
TA-100 sitive control with metabol	- - - - lic activation: S9 (-/+) +(5%)	Sodium Azide Untreated Solvent Compound 2-Anthramine	10/15/2013 Dose per plate (ug)	Count 1433.00 12133 12167 Percent S9: Mean Plate Count 579.67	Deviation	Ratio Treated / Solvent	1402 125 132 Individu 599	1498 128 116 116 118 119 119 119 128 128 119	139 11 11 Coun 566
TA-100 Sitive control with metabol	- - - - - - - - - - - - - - - - - - -	Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated	10/15/2013 Dose per plate (ug)	Count 1433.00 121.33 121.67 Percent S9: Mean Plate Count 579.67 125.33	Deviation	Ratio Treated / Solvent	1402 125 132 Individu 599 129	1498 128 116 116 128 116	139 11 11 Coun 566
TA-100 Sitive control with metabol Tester Strain TA-100	Control Cont	Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated	10/15/2013 Dose per plate (ug) 0.5	Count 1433.00 121.33 121.67 Percent S9: Mean Plate Count 579.67 125.33	Deviation 56.31 9.07 8.96 5% Standard Deviation 17.47 3.51 2.08	Ratio Treated / Solvent	1402 125 132 Individu 599 129	1498 128 116 116 128 116	139 11 11 Coun 566
TA-100 sitive control with metabol	Control Cont	Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated	10/15/2013 Dose per plate (ug) 0.5	Count 1433.00 12133 12167 Percent S9: Mean Plate Count 579.67 125.33 13167	Deviation 56.31 9.07 8.96 5% Standard Deviation 17.47 3.51 2.08	Ratio Treated / Solvent	1402 125 132 Individu 599 129	1498 128 116 116 128 116	139 11 11
TA-100 Sitive control with metabol Tester Strain TA-100	Control Cont	Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated	10/15/2013 Dose per plate (ug) 0.5	Count 1433.00 12133 12167 Percent S9: Mean Plate Count 579.67 125.33 13167	Deviation 56.31 9.07 8.96 5% Standard Deviation 17.47 3.51 2.08	Ratio Treated / Solvent 4.4	1402 125 132 Individu 599 129	1498 128 116 116 128 116	139 11 11 Coun 566
TA-100 Sitive control with metabol Tester Strain TA-100 Sitive control with metabol		Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated Solvent	10/15/2013 Dose per plate (ug) 0.5	Count 1433.00 121.33 121.67 Percent S9: Mean Plate Count 579.67 125.33 131.67 Percent S9:	Deviation	Ratio Treated / Solvent 4.4 10 Ratio Treated /	1402 125 132 Individe 599 129 131	1498 128 116 116 128 116 120 121 122 134	139 111 111 Coun 566 122
TA-100 Sitive control with metabol Tester Strain TA-100 Sitive control with metabol	- - -	Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound	10/15/2013 Dose per plate (ug) 0.5 10/15/2013 Dose per plate (ug)	Count 1433.00 12133 12167 Percent S9: Mean Plate Count 579.67 125.33 13167 Percent S9: Mean Plate Count Count Count Count Count Count Count Count Count Count Count Count	Deviation 56.31 9.07 8.96	Ratio Treated / Solvent 4.4 10 Ratio Treated / Solvent	1402 125 132 Individu 599 129 131	1498 128 116 116 121 121 122 134	139 111 111 Coun 566 12 13
TA-100 Sitive control with metabol Tester Strain TA-100 Sitive control with metabol		Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine	10/15/2013 Dose per plate (ug) 0.5	Count 1433.00 12133 12167 Percent \$9: Mean Plate Count 579.67 125.33 13167 Percent \$9: Mean Plate Count 33150	Deviation 56.31 9.07 8.96	Ratio Treated / Solvent 4.4 10 Ratio Treated / Solvent 2.6	1402 125 132 Individi 599 129 131	1498 128 116 116 116 116 117 117 118 118 118 118 118 118 118 118	139 111 111 Coun 566 12 13
TA-100 Sitive control with metabol Tester Strain TA-100 Sitive control with metabol Tester Strain	- - -	Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound	10/15/2013 Dose per plate (ug) 0.5 10/15/2013 Dose per plate (ug)	Count 1433.00 12133 12167 Percent S9: Mean Plate Count 579.67 125.33 13167 Percent S9: Mean Plate Count Count Count Count Count Count Count Count Count Count Count Count	Deviation 56.31 9.07 8.96	Ratio Treated / Solvent 4.4 10 Ratio Treated / Solvent	1402 125 132 Individu 599 129 131	1498 128 116 116 121 121 122 134	139 111 111 Coun 56 12 13

Table 48: Individual and mean plate counts for *Salmonella* TA-1535 exposed to Swedish Biofuel 7633 with JP8 additives (POSF 8452)

	abolic activation:		10/24/201	3					
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	M ean Plate Count	Standard Deviation	Ratio Treated / Solvent	Individa	ıal Plate	Caun
TA-1535		SB	5.000	12.33	1.15	1.0	13	13	Cour
1 A - D33	-	SB	2.500		2.52	1.3		13	
	-		1,250	15.67			16		
	-	SB		13.67	4.04	1.1	10	18	
	_	SB	0.625	14.33	1.53	1.2	13	16	
	-	SB	0.313	12.67	0.58	1.1	12	13	
	-	SB	0.156	13.00	1.00	1.1	14	13	
compound with metabol	lic activation:		10/24/201	3 Percent S9:	5%				
				M ean Plate	Standard	Ratio Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent		ial Plate	Cou
TA-1535	+(5%)	SB	5.000	10.00	1.73	0.7	11	11	_
	+(5%)	SB	2.500	15.00	173	1.0	16	13	
	+(5%)	SB	1.250	15.67	4.62	1.1	13	21	
	+(5%)	SB	0.625	11.00	3.61	0.8	14	12	
	+(5%)	SB	0.313	13.00	2.65	0.9	15	14	
<u> </u>	+(5%)	SB	0.156	17.67	5.13	1.2	19	12	2
compound with metabol	lic activation:		10/24/201	3 Percent S9:	10%				
compound with metabol	ilo activation.		10/24/20	l elcelle 39.	10 /0	Ratio	1		
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent		ıal Plate	
TA-1535	+(10%)	SB	5.000	12.33	3.79	0.8	8	15	
	+(10%)	SB	2.500	14.00	4.58	0.9	18	9	
	+(10%)	SB	1.250	15.33	2.08	1.0	16	13	
	+(10%)	SB	0.625	14.00	3.46	0.9	12	12	
	+(10%)	SB	0.313	14.00	5.29	0.9	12	20	
	+(10%)	SB	0.156	13.00	9.85	0.8	24	10	
			10/24/201	3					
itive control without meta	abolic activation			,					
itive control without meta	abolic activation:		10/2 1/20			l Ratio			
tive control without meta	abolic activation:		10, E 1, E 0	M ean Plate	Standard	Ratio Treated /			
				Mean Plate	Standard	Treated /	Individu	ıal Plate	Com
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Treated / Solvent		ıal Plate	
	\$9 (-/+) -	Compound Sodium Azide		Count 445.33	Deviation 25.03	Treated / Solvent 37.1	444	421	
Tester Strain	S9 (-/+) - -	Compound Sodium Azide Untreated	Dose per plate (ug)	Count 445.33 8.00	25.03 2.65	Treated / Solvent	444 11	421 7	4
Tester Strain	\$9 (-/+) -	Compound Sodium Azide	Dose per plate (ug)	Count 445.33	Deviation 25.03	Treated / Solvent 37.1	444	421	4
Tester Strain TA-1535	S9 (-/+) - - -	Compound Sodium Azide Untreated	Dose per plate (ug)	Count 445.33 8.00	25.03 2.65 2.65	Treated / Solvent 37.1 0.7	444 11	421 7	4
Tester Strain TA-1535 itive control with metabo	S9 (-/+) lic activation:	Compound Sodium Azide Untreated Solvent	Dose per plate (ug) 3 10/24/201	Count 445.33 8.00 12.00 Percent S9: Mean Plate	25.03 2.65 2.65 5% Standard	Treated / Solvent 37.1 0.7 Ratio Treated /	444 11 15	421 7 10	
Tester Strain TA-f535 tive control with metabo	S9 (-/+) lic activation:	Compound Sodium Azide Untreated Solvent Compound	Dose per plate (ug) 3 10/24/201 Dose per plate (ug)	Count	25.03 2.65 2.65 5% Standard Deviation	Treated / Solvent 37.1 0.7 Ratio Treated / Solvent	444 11 15	421 7 10	Cour
Tester Strain TA-1535 tive control with metabo	S9 (-/+)	Compound Sodium Azide Untreated Solvent Compound 2-Anthramine	Dose per plate (ug) 3 10/24/201	Count	25.03 2.65 2.65 5% Standard Deviation 5.13	Treated / Solvent 37.1 0.7 Ratio Treated / Solvent 2.1	444 11 15 Individu 35	421 7 10 ual Plate 32	Cour
Tester Strain TA-1535 tive control with metabo Tester Strain	\$9 (-/+)	Compound Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated	Dose per plate (ug) 3 10/24/201 Dose per plate (ug)	Count	25.03 2.65 2.65 5% Standard Deviation 5.13 3.00	Treated / Solvent 37.1 0.7 Ratio Treated / Solvent	444 11 15 Individu 35	421 7 10 4al Plate 32 15	Cour
Tester Strain TA-f535 tive control with metabo	S9 (-/+)	Compound Sodium Azide Untreated Solvent Compound 2-Anthramine	Dose per plate (ug) 3 10/24/201 Dose per plate (ug)	Count	25.03 2.65 2.65 5% Standard Deviation 5.13	Treated / Solvent 37.1 0.7 Ratio Treated / Solvent 2.1	444 11 15 Individu 35	421 7 10 ual Plate 32	Cour
Tester Strain TA-1535 itive control with metabo Tester Strain TA-1535	\$9 (-/+)	Compound Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated	Dose per plate (ug) 3 10/24/201 Dose per plate (ug) 0.5	Count 445.33 8.00 12.00 3 Percent S9: Mean Plate Count 30.67 12.00 14.33	Deviation	Treated / Solvent 37.1 0.7 Ratio Treated / Solvent 2.1	444 11 15 Individu 35	421 7 10 4al Plate 32 15	Cour
Tester Strain TA-1535 tive control with metabo Tester Strain	\$9 (-/+)	Compound Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated	Dose per plate (ug) 3 10/24/201 Dose per plate (ug) 0.5	Count	Deviation	Treated / Solvent 37.1 0.7 0.7 Ratio Treated / Solvent 2.1 0.8	444 11 15 Individu 35	421 7 10 4al Plate 32 15	Cour
Tester Strain TA-1535 tive control with metabo Tester Strain TA-1535	\$9 (-/+)	Compound Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated	Dose per plate (ug) 3 10/24/201 Dose per plate (ug) 0.5	Count	Deviation 25.03 2.65 2.65 5% Standard Deviation 5.13 3.00 5.13	Treated / Solvent 37.1 0.7 Ratio Treated / Solvent 2.1 0.8	444 11 15 Individu 35	421 7 10 4al Plate 32 15	Cour
Tester Strain TA-1535 tive control with metabo Tester Strain TA-1535	\$9 (-/+) lic activation: \$9 (-/+) + (5%) + (5%) + (5%) lic activation:	Compound Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated Solvent	Dose per plate (ug) 3 10/24/201 Dose per plate (ug) 0.5	Count	Deviation 25.03 2.65 2.65 2.65	Treated / Solvent 37.1 0.7 Ratio Treated / Solvent 2.1 0.8 Ratio Treated /	444 11 15 Individu 35 12 10	421 7 10	Cour
Tester Strain TA-1535 tive control with metabo Tester Strain TA-1535 tive control with metabo	\$9 (-/+) lic activation: \$9 (-/+) + (5%) + (5%) + (5%) - (5%) - (5%) S9 (-/+)	Compound Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound	Dose per plate (ug) 3 10/24/201 Dose per plate (ug) 0.5 10/24/201 Dose per plate (ug)	Count	Deviation 25.03 2.65 2.65	Treated / Solvent 37.1 0.7 Ratio Treated / Solvent 2.1 0.8 Ratio Treated / Solvent	444 11 15 Individu 35 12 10	421 7 10 10 10 10 11 12 15 13 13	Cour
Tester Strain TA-1535 tive control with metabo Tester Strain TA-1535	S9 (-/+)	Compound Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine	Dose per plate (ug) 3 10/24/201 Dose per plate (ug) 0.5	Count	Deviation 25.03 2.65 2.65 5% Standard Deviation 5.13 3.00 5.13 10% Standard Deviation 4.04	Treated / Solvent 37.1 0.7 Ratio Treated / Solvent 2.1 0.8 Ratio Treated / Solvent 2.1 2.1 2.1	444	421 7 10 10 14 15 15 13	Cour
Tester Strain TA-1535 tive control with metabo Tester Strain TA-1535 tive control with metabo	\$9 (-/+) lic activation: \$9 (-/+) + (5%) + (5%) + (5%) - (5%) - (5%) S9 (-/+)	Compound Sodium Azide Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound	Dose per plate (ug) 3 10/24/201 Dose per plate (ug) 0.5 10/24/201 Dose per plate (ug)	Count	Deviation 25.03 2.65 2.65	Treated / Solvent 37.1 0.7 Ratio Treated / Solvent 2.1 0.8 Ratio Treated / Solvent	444 11 15 Individu 35 12 10	421 7 10 10 10 10 11 12 15 13 13	Cour

Table 49: Individual and mean plate counts for *Salmonella* TA-1537 exposed to Swedish Biofuel 7633 with JP8 additives (POSF 8452)

st compound without met	abolic activation:		11/1/2013		1	1			
						Ratio			
				M ean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ıal Plate	Coun
TA-1537	-	SB	5.000	20.33	5.51	1.6	14	24	23
	-	SB	2.500	16.33	2.52	1.3	19	16	14
-	-	SB	1.250	14.33	3.79	1.1	16	17	10
	-	SB	0.625	11.00	4.36	0.8	13	6	14
	-	SB	0.313	12.33	2.31	0.9	15	11	1
	-	SB	0.156	13.00	1.00	1.0	13	14	12
				10.100			~		
t compound with metabo	lic activation:		11/1/2013	Percent S9:	5%				
st compound with metable	nic activation.	1 1	17 720 6	l ercent os.	1	Ratio	1		
				Mean Plate	Standard	Treated /			
Tester Strain	S9 (-/+)	Test Fuel	Description (vI)	Count	Deviation	Solvent	1	ıal Plate	C
		+	Dose per plate (uL)						
TA-1537	+(5%)	SB	5.000	15.67	2.89	0.7	14	19	14
	+(5%)	SB	2.500	20.00	4.00	0.9	20	24	16
	+(5%)	SB	1.250	20.67	6.51	0.9	27	21	14
	+(5%)	SB	0.625	16.00	4.36	0.7	21	13	14
	+(5%)	SB	0.313	20.67	3.21	0.9	23	22	17
	+(5%)	SB	0.156	18.67	6.11	0.8	20	24	12
st compound with metabo	lic activation:		11/1/2013	Percent S9:	10 %				
						Ratio			
				M ean Plate	Standard	Treated /	1		
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent	Individu	ıal Plate	Coun
TA-1537	+(10%)	SB	5.000	17.67	6.35	1.0	14	14	25
	+(10%)	SB	2.500	14.00	4.00	0.8	18	10	14
	+(10%)	SB	1.250	17.33	4.16	0.9	22	14	16
	+(10%)	SB	0.625	19.67	3.79	1.1	24	17	18
	+(10%)	SB	0.313	14.00	1.00	0.8	15	14	13
	+(10%)	SB	0.156	18.67	3.21	1.0	20	15	2
	T (10 /0)	35	0.56	10.07	3.21	1.0	20	D.	
sitive control without me	tabalia aativatian		11/1/2013						
Sitive control without me	labolic activation	· ·	17 720 8	1	ı	Ratio	1		
				l					
				Mean Plate	Standard	Treated /			_
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent		ial Plate	
TA-1537	-	9-Amino acridine	100	929.00	126.01	71.5	1056	927	80
	-	Untreated		17.33	4.62	1.3	12	20	20
	-	Solvent		13.00	1.73		11	14	14
sitive control with metabo	olic activation:		11/1/2013	Percent S9:	5%				
						Ratio			
				M ean Plate	Standard	Treated /	1		
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Solvent	Individu	ıal Plate	Coun
	+(5%)	2-Anthramine	3	52.67	2.52	2.3	55	50	53
TA-1537		Untreated		17.67	2.52	0.8	20	18	15
TA-1537	+(5%)			22.67	3.21		19	24	25
TA-1537	+(5%) +(5%)	Solvent		22.07					<u> </u>
TA-1537	+(5%)	Solvent		22.07	3.21				
	+(5%)	Solvent	11/1/2013						
TA-1537	+(5%)	Solvent	11/1/2013	Percent S9:		Ratio			
	+(5%)	Solvent	11/1/2013	Percent S9:	10%	Ratio			
sitive control with metabo	+(5%)			Percent S9:	10% Standard	Treated /	و الماليون	ial Distr	Com
sitive control with metabo	+(5%) blic activation: \$9 (-/+)	Compound	Dose per plate (ug)	Mean Plate	10% Standard Deviation	Treated / Solvent		ıal Plate	
sitive control with metabo	+(5%) blic activation: \$9 (-/+) +(10%)	Compound 2-Anthramine		Mean Plate Count 33.67	10% Standard Deviation 2.31	Treated / Solvent 18	35	31	35
sitive control with metabo	+(5%) blic activation: \$9 (-/+) +(10%) +(10%)	Compound 2-Anthramine Untreated	Dose per plate (ug)	Mean Plate Count 33.67 26.67	Standard Deviation 2.31 5.03	Treated / Solvent	35 32	31 22	35 26
sitive control with metabo	+(5%) blic activation: \$9 (-/+) +(10%)	Compound 2-Anthramine	Dose per plate (ug)	Mean Plate Count 33.67	10% Standard Deviation 2.31	Treated / Solvent 18	35	31	35
Sitive control with metabo Tester Strain TA-1537	+(5%) Dic activation: \$9 (-/+) +(10%) +(10%)	Compound 2-Anthramine Untreated Solvent	Dose per plate (ug)	Mean Plate Count 33.67 26.67 18.33	10% Standard Deviation 2.31 5.03 2.08	Treated / Solvent 18	35 32	31 22	3

Table 50: Individual and mean plate counts for *E. coli* WP2 exposed to Swedish Biofuel 7633 with JP8 additives (POSF 8452)

	bolic activation:		12/11/2013						
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Mean Plate Count	Standard Deviation	Ratio Treated / Solvent	Individu	ual Plate	Counts
WP2	33 (-7+)	SB	5.000	32.67	5.51	0.8	27	38	33
VVI Z	 	SB	2.500	25.67	3.79	0.6	30	24	23
	-	SB	1.250	23.33	1.53	0.5	22	25	23
	-	SB	0.625	28.00	13.53	0.5	15	27	42
	-	SB	0.313	38.00	6.08	0.9	42	41	31
	-	SB	0.156	33.33	7.37	0.8	39	36	25
est compound with metaboli	ic activation:		12/11/2013	Percent S9:	5%				
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Mean Plate Count	Standard Deviation	Ratio Treated / Solvent	Individual Plate Count		
WP2	+(5%)	SB	5.000	40.67	6.81	1.0	43	33	46
	+(5%)	SB	2.500	24.33	6.11	0.6	31	19	23
	+(5%)	SB	1.250	43.33	10.41	1.0	55	35	40
-	+(5%)	SB	0.625	36.33	7.23	0.9	28	40	41
	+(5%)	SB	0.313	44.33	1.53	1.1	43	46	44
	+(5%)	SB	0.156	49.67	13.43	1.2	44	40	65
	+(376)	SD	0.56	49.07	0.43	1.2	44	40	03
est compound with metaboli	ic activation:		12/11/2013	Percent S9:	10.9/.				
est compound with metaboli	ic activation.		2/10/2015			Ratio			
		.		Mean Plate	Standard	Treated /	l		_
Tester Strain	S9 (-/+)	Test Fuel	Dose per plate (uL)	Count	Deviation	Solvent		ual Plate	
WP2	+(10%)	SB	5.000	40.67	3.79	1.0	45	39	38
	+(10%)	SB	2.500	32.00	10.58	0.8	40	36	20
	+(10%)	SB	1.250	35.33	6.66	0.9	43	31	32
	+(10%)	SB	0.625	41.67	15.01	1.1	33	59	33
	+(10%)	SB	0.313	41.67	5.77	1.1	35	45	45
	+(10%)	SB	0.156	35.67	9.61	0.9	27	34	46
ositive control without meta	pholic activation		12/11/2013						
			E/ 1120 D			Ratio	l e		
	DOILC ACTIVATION								
	DOILC ACTIVATION			Moan Blato	Standard				
		Compound	Door nor plate (ug)	Mean Plate	Standard	Treated /	Individu	ual Blata	Caunta
Tester Strain	S9 (-/+)	Compound	Dose per plate (ug)	Count	Deviation	Treated / Solvent		ual Plate	
	S9 (-/+)	4NQO	Dose per plate (ug)	Count 1025.33	Deviation 123.70	Treated / Solvent 24.0	960	1168	948
Tester Strain	S9 (-/+) - -	4NQO Untreated		Count 1025.33 41.33	Deviation 123.70 4.73	Treated / Solvent	960 43	1168 45	948 36
Tester Strain	S9 (-/+)	4NQO		Count 1025.33	Deviation 123.70	Treated / Solvent 24.0	960	1168	948
Tester Strain WP2	S9 (-/+) - - -	4NQO Untreated	2.5	Count 1025.33 41.33 42.67	123.70 4.73 4.04	Treated / Solvent 24.0	960 43	1168 45	948 36
Tester Strain	S9 (-/+) - - -	4NQO Untreated	2.5	Count 1025.33 41.33	123.70 4.73 4.04	Treated / Solvent 24.0	960 43	1168 45	948 36
Tester Strain WP2	S9 (-/+) - - -	4NQO Untreated	2.5	Count 1025.33 41.33 42.67	123.70 4.73 4.04	Treated / Solvent 24.0 10	960 43	1168 45	948 36
Tester Strain WP2 ositive control with metabol	S9 (-/+)	4NQO Untreated Solvent	2.5 12/11/2013	Count 1025.33 41.33 42.67 Percent S9:	Deviation 123.70 4.73 4.04	Treated / Solvent 24.0 10	960 43 45	1168 45 45	948 36 38
Tester Strain WP2	\$9 (-/+) ic activation:	4NQO Untreated	2.5 12/11/2013 Dose per plate (ug)	Count 1025.33 4133 42.67 Percent S9: Mean Plate Count	Deviation	Treated / Solvent 24.0 10 Ratio Treated / Solvent	960 43 45	1168 45 45 45	948 36 38
Tester Strain WP2 ositive control with metabol Tester Strain	\$9 (-/+) + +	4NQO Untreated Solvent Compound 2-Anthramine	2.5 12/11/2013	Count 1025.33 4133 42.67 Percent S9: Mean Plate Count 552.67	Deviation 123.70 4.73 4.04 5% Standard Deviation 109.57	Treated / Solvent 24.0 10 Ratio Treated / Solvent 3.3	960 43 45 Individe 574	1168 45 45 45 ual Plate 650	948 36 38 Counts 434
Tester Strain WP2 ositive control with metabol Tester Strain	S9 (-/+)	4NQO Untreated Solvent Compound 2-Anthramine Untreated	2.5 12/11/2013 Dose per plate (ug)	Count 1025.33 41.33 42.67 Percent \$9: Mean Plate Count 552.67 52.33	Deviation 123.70 4.73 4.04 5% Standard Deviation 109.57 9.71	Treated / Solvent 24.0 10 Ratio Treated / Solvent	960 43 45 Individe 574 44	1168 45 45 45 ual Plate 650 50	948 36 38 Counts 434 63
Tester Strain WP2 ositive control with metabol Tester Strain	\$9 (-/+) + +	4NQO Untreated Solvent Compound 2-Anthramine	2.5 12/11/2013 Dose per plate (ug)	Count 1025.33 4133 42.67 Percent S9: Mean Plate Count 552.67	Deviation 123.70 4.73 4.04 5% Standard Deviation 109.57	Treated / Solvent 24.0 10 Ratio Treated / Solvent 3.3	960 43 45 Individe 574	1168 45 45 45 ual Plate 650	948 36 38 Counts 434
Tester Strain WP2 ositive control with metabol Tester Strain WP2	S9 (-/+) ic activation: S9 (-/+) +(5%) +(5%)	4NQO Untreated Solvent Compound 2-Anthramine Untreated	2.5 12/1/2013 Dose per plate (ug) 20	Count 1025.33 4133 42.67 Percent \$9: Mean Plate Count 552.67 52.33 4167	Deviation 123.70 4.73 4.04 5% Standard Deviation 109.57 9.71 4.16	Treated / Solvent 24.0 10 Ratio Treated / Solvent 3.3	960 43 45 Individe 574 44	1168 45 45 45 ual Plate 650 50	948 36 38 Counts 434 63
Tester Strain WP2 ositive control with metabol Tester Strain	S9 (-/+) ic activation: S9 (-/+) +(5%) +(5%)	4NQO Untreated Solvent Compound 2-Anthramine Untreated	2.5 12/1/2013 Dose per plate (ug) 20	Count 1025.33 41.33 42.67 Percent \$9: Mean Plate Count 552.67 52.33	Deviation 123.70 4.73 4.04 5% Standard Deviation 109.57 9.71 4.16	Treated / Solvent 24.0 10 10 Ratio Treated / Solvent 13.3 13	960 43 45 Individe 574 44	1168 45 45 45 ual Plate 650 50	948 36 38 Counts 434 63
Tester Strain WP2 ositive control with metabol Tester Strain WP2 ositive control with metabol	\$9 (-/+)	4NQO Untreated Solvent Compound 2-Anthramine Untreated Solvent	2.5 12/11/2013 Dose per plate (ug) 20 12/11/2013	Count 1025.33 4133 42.67 Percent \$9: Mean Plate Count 552.67 52.33 4167 Percent \$9:	Deviation 123.70 4.73 4.04 5% Standard Deviation 109.57 9.71 4.16 Standard	Ratio Treated / Solvent 24.0 10 Ratio Treated / Solvent 3.3 13 Ratio Treated /	960 43 45 Individe 574 44 43	1168 45 45 45 45 45 45 650 50 37	948 36 38 Counts 434 63 45
Tester Strain WP2 ositive control with metabol Tester Strain WP2	S9 (-/+) ic activation: S9 (-/+) +(5%) +(5%)	4NQO Untreated Solvent Compound 2-Anthramine Untreated	2.5 12/1/2013 Dose per plate (ug) 20	Count 1025.33 41.33 42.67 Percent S9: Mean Plate Count 552.67 52.33 4167 Percent S9:	Deviation 123.70 4.73 4.04 5% Standard Deviation 109.57 9.71 4.16	Ratio Treated / Solvent 24.0 10 Ratio Treated / Solvent 3.3 13	960 43 45 Individe 574 44 43	1168 45 45 45 ual Plate 650 50	948 36 38 Counts 434 63 45
Tester Strain WP2 ositive control with metabol Tester Strain WP2 ositive control with metabol	\$9 (-/+)	4NQO Untreated Solvent Compound 2-Anthramine Untreated Solvent	2.5 12/11/2013 Dose per plate (ug) 20 12/11/2013	Count 1025.33 4133 42.67 Percent \$9: Mean Plate Count 552.67 52.33 4167 Percent \$9:	Deviation 123.70 4.73 4.04 5% Standard Deviation 109.57 9.71 4.16 Standard	Ratio Treated / Solvent 24.0 10 Ratio Treated / Solvent 3.3 13 Ratio Treated /	960 43 45 Individe 574 44 43	1168 45 45 45 45 45 45 650 50 37	948 36 38 Counts 434 63 45
Tester Strain WP2 ositive control with metabol Tester Strain WP2 ositive control with metabol Tester Strain	\$9 (-/+)	4NQO Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine	2.5 12/1/2013 Dose per plate (ug) 20 12/1/2013 Dose per plate (ug)	Count 1025.33 4133 42.67 Percent \$9: Mean Plate Count 552.67 52.33 4167 Percent \$9: Mean Plate Count 553.33	Deviation 123.70 4.73 4.04 5%	Ratio Treated / Solvent 24.0 10 Ratio Treated / Solvent 13.3 13 Ratio Treated / Solvent	960 43 45 Individu 574 44 43	## 1168	948 36 38 Counts 434 63 45 Counts
Tester Strain WP2 ositive control with metabol Tester Strain WP2 ositive control with metabol Tester Strain	\$9 (-/+)	4NQO Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine Untreated	2.5 12/1/2013 Dose per plate (ug) 20 12/1/2013 Dose per plate (ug)	Count 1025.33 41.33 42.67 Percent S9: Mean Plate Count 552.67 52.33 41.67 Percent S9: Mean Plate Count 533.33 53.33	Deviation 123.70 4.73 4.04 5% Standard Deviation 109.57 9.71 4.16 Standard Deviation 96.77 8.39	Treated / Solvent 24.0 10 10 Ratio Treated / Solvent 13.3 13 Ratio Treated / Solvent 13.6	960 43 45 Individi 574 44 43 Individi 608	1168 45 45 45 45 650 50 37	948 36 38 Counts 434 63 45 Counts Counts
Tester Strain WP2 ositive control with metabol Tester Strain WP2 ositive control with metabol Tester Strain	\$9 (-/+)	4NQO Untreated Solvent Compound 2-Anthramine Untreated Solvent Compound 2-Anthramine	2.5 12/1/2013 Dose per plate (ug) 20 12/1/2013 Dose per plate (ug)	Count 1025.33 4133 42.67 Percent \$9: Mean Plate Count 552.67 52.33 4167 Percent \$9: Mean Plate Count 553.33	Deviation 123.70 4.73 4.04 5% Standard Deviation 109.57 9.71 4.16 Standard Deviation	Treated / Solvent 24.0 10 10 Ratio Treated / Solvent 13.3 13 Ratio Treated / Solvent 13.6	960 43 45 Individe 574 44 43 Individe 608	1168 45 45 45 45 650 50 37	948 36 38 Counts 434 63 45 Counts